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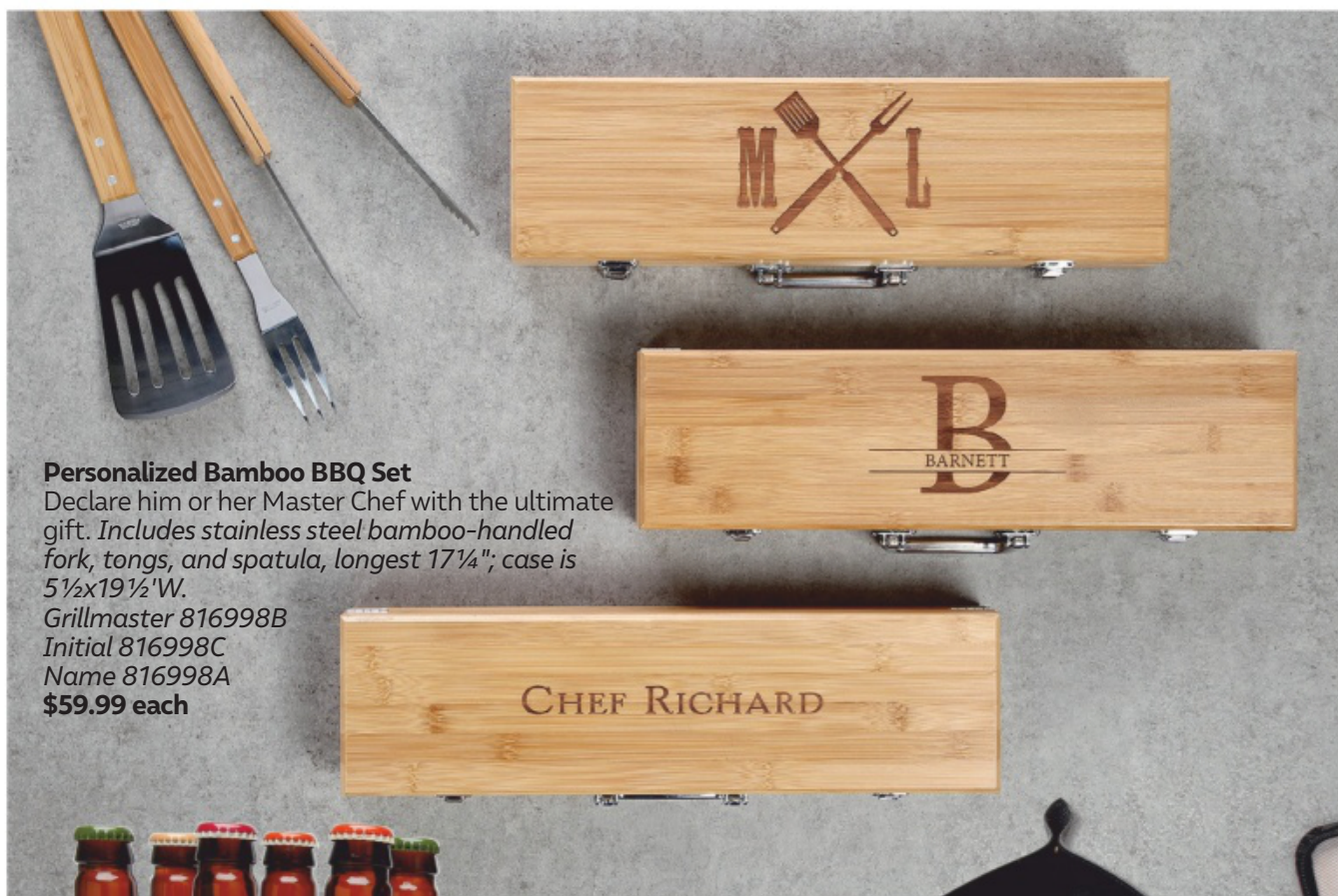
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44

Hurricanes, Spitfires and Me-109s mix it up in the classic 1969 Hollywood movie *Battle of Britain*.

FEATURES



60

Jean Harlow and Howard Hughes

26 NIGHT TERROR

The twin-engine Messerschmitt Me-110 overcame a dismal record in the Battle of Britain to become the most feared night fighter of World War II.

By Stephan Wilkinson

36 RODDENBERRY'S WAR

Two decades before he invented an entire universe, *Star Trek's* creator survived anti-aircraft shells, tropical storms and a deadly jungle crash while piloting B-17s.

By Steve Birdsall

44 MAKING BATTLE OF BRITAIN

Fifty years ago, producers scrambled to find stunt doubles for classic warbirds, and former friends and foes came together to make an air war epic.

By Don Hollway

52 THUNDER IN THE CINEMA

Hollywood has attempted to bring authentic flying experiences to the big screen with varying degrees of success, as evidenced by this selection of jet age movies.

By Mark Carlson

60 HOWARD HUGHES' HELL'S ANGELS

The young millionaire combined his first two loves—flying and movie-making—to produce a blockbuster World War I picture featuring spectacular air combat scenes.

By Christopher Warner

DEPARTMENTS

5 MAILBAG

6 BRIEFING

10 AVIATORS

The opportunity to fly fighters helped turn a potentially troubled man, "Screwball" Beurling, into Canada's leading ace of World War II.

By Bob Gordon

14 RESTORED

When film studios came looking for stand-ins for Me-109s, these license-built Spanish *Buchóns* answered the call.

By Jon Guttman



16 EXTREMES

After Nikita Khrushchev used the Tupolev Tu-114 for a trip to the U.S. in 1959, the airliner set records as the world's fastest turboprop.

By Robert Guttman

18 STYLE

Showcasing products of interest to aviation enthusiasts and pilots.

24 LETTER FROM AVIATION HISTORY

66 REVIEWS

70 FLIGHT TEST

72 AERO ARTIFACT



ON THE COVER: A radar-equipped Messerschmitt Me-110G-4 night fighter armed with upward-firing 20mm "Schräge Musik" cannons attacks an Avro Lancaster bomber over a burning German city late in WWII. Cover illustration: Piotr Forkasiewicz.

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You'll find much more from *Aviation History* on the web's leading history resource: HistoryNet.com

TOP 10 BEST AND WORST AVIATION MOVIES

We asked film and aviation experts to rank some of the best and worst flying films of all time. Where do your favorites stand on the list, and on which side of the ledger do they fall? Our pick for the worst aviation film ever made may surprise you (it's pictured above).

WILLY MESSERSCHMITT: WIZARD OF WARPLANES

Over nearly half a century, Willy Messerschmitt designed a remarkable array of aircraft, from the iconic Bf-109, the most effective fighter of its day, to the groundbreaking Me-262 jet and rocket-powered Me-163.

12 MOVIES WITH AIRPLANES IN STARRING ROLES

Filmmakers have long relied on real aircraft to generate raw movie excitement. Here's a small sample of films starring authentic warbirds from the days before computer-generated imagery became de rigueur.

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MISSING WOMAN FORMATION

Loved the "Briefing" story and picture [right] on P. 6, July issue, but please can we have the names of the wonderful women in the photo? >

Nan Williams
West Hollywood,
Calif.



> Sure, they are: (back row, from left) Lt. Cmdr. Jennifer Hesling, Lt. Cmdr. Paige Blok, Commander Stacy Uttecht, Commander Leslie Mintz and Lt. Cmdr. Danielle Thiriot; (front row, from left) Lieutenants Christy Talisse, Kelly Harris, Emily Rixey and Amanda Lee.

MERCURY MIXUP

Congrats on another great issue [July] with diverse, interesting subjects. I did note one error in "Flight Test." In question 3 of "Happy Moon Landings," answer D is incorrect, as no Mercury astronaut ever commanded a space shuttle. John Young did command the shuttle, but he was selected in 1962 as part of the first group of Gemini astronauts, and made his first flight in Gemini 3 with Gus Grissom. However, an original Mercury astronaut did serve as a shuttle payload specialist in 1998. John Glenn was 77 when he flew into space for his second and final flight.

Joseph J. Brescia
Hopewell Junction, N.Y.

CARPETBAGGERS

Kudos to Don Hollway for his great overview of Carpetbagger operations during World War II [July]. For further information about the Carpetbaggers, your readers might be interested in a 2014 book titled *A Drop in the Night*, by Royce A. Fulmer, with Thea

Rademacher. Fulmer was a flight engineer on one of the B-24Ds operating out of Harrington, England. The book is a first-person account of Carpetbagger operations. I had the honor of meeting Fulmer several times at his home in Topeka, Kan., before he passed (about two years ago), as I was building a 1/72nd-scale model of the interior of a B-24D for illustrations in his book. As an aside, Fulmer was also a teenage bootlegger before he entered the service, and after WWII remained in what became the U.S. Air Force, and had some great stories to tell about that also. The book is a great read!

Bill Eggering
Laclede, Mo.

FIRST LEND-LEASE LIBERATOR



The first Lend-Lease Consolidated B-24 Liberator for the Royal Air Force was delivered to Scotland on April 9, 1941, not in July 1941 as stated in the July issue's "Aviators." My airmail collection includes a cover [above] carried on that trip, canceled on March 31 at New York before departure and on April 11 at London for the pilot's return trip on another aircraft. It represents

the earliest U.S. "bomber pouch" mail of World War II. The July 1941 flight on a modified B-24 (later designated C-87 Liberator Express) inaugurated the U.S. Army Air Corps Ferrying Command's air transport service from Bolling Field in Washington, D.C., via Montreal and Gander Lake, Newfoundland, to Ayr, Scotland, and back, carrying urgent passengers, cargo and mail in both directions about six times per month until frigid weather conditions prevented North Atlantic flights after mid-October.

Ken Lawrence
Spring Mills, Pa.

X-1 ENGINEER

It was enjoyable to read Mark Carlson's article "Dropping the Orange Beast" mentioning U.S. Air Force engineer Jack Ridley in the May issue. My father, USAF Major Merwin Kanter, worked for Colonel Ridley on family-accompanied tours in Tokyo, Japan. I was 9 years old when they were both killed on March 12, 1957, when their Douglas VC-47A crashed into Mt. Shirouma in Japan. Also killed were crew members Staff Sgt. Charles E. Carter and Tech. Sgt. Norman J. Landry. The flight was planned to be a roundabout from Tokyo to Hamamatsu Air Base southwest of Tokyo. Ridley was copilot and my father was pilot. On the second leg of the flight they turned westerly from Niigata and encountered a very strong right crosswind from the north. Apparently they didn't take the left drift into account and were unknow-

ingly blown off course to the south and into Mt. Shirouma.

My father and Colonel Ridley had a strong influence on me. I joined the USAF in the summer of 1969 and got my wings at Randolph AFB in 1970. I flew C-141A Starlifters stationed at McChord AFB from 1970-1974. I flew all over the Pacific, including in the vicinity of that darn mountain. As an aside, Ridley's real first name was "Jackie" and his nickname was "Jack."

Ron Kanter
Telluride, Colo.

MURDER IN MEXICO

Regarding the fabric that was removed from the plane with the two airmen's messages, mentioned in "A Turn For the Worse" and "Aero Artifact" [March], where is this fabric now?

Toby Shields
Liverpool, N.Y.

Author Craig Thorson responds: Both sections of the DH-4 fuselage ended up in the collection of aviation enthusiast Mary E. "Mother" Tusch at her home near the campus of UC Berkeley. One of the DH-4 pilots, Frederick Waterhouse, had visited her home and signed her wallpaper, along with hundreds of other aviators. The name of the other pilot, Cecil Connolly, was added on his behalf by his father. As Tusch's entire collection of early-aviation artifacts was donated to the Smithsonian Institution in 1948 through the assistance of her son-in-law, Paul Garber, I would imagine they still exist in their archives.

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BRIEFING



MOVIE MITCHELL

The EAA's North American B-25H *Berlin Express* takes to the air following a nearly 4½-year restoration. Inset: *Berlin Express* appeared in the 1970 feature film *Catch-22*.

EAA'S CATCH-22 B-25

The Experimental Aircraft Association recently completed the full restoration of a North American B-25H Mitchell medium bomber, one of only four H models in existence—two flying and two

on static display, all of them in the United States. Since this airplane, at the time owned by movie stunt pilot Frank Tallman, appeared in the original 1970 film of the Joseph Heller novel *Catch-22*, the EAA repainted the airplane in the colors of that fic-

tional Mitchell, *Berlin Express*. Nobody can complain about a misplaced insignia or the wrong font on a unit designator, as the airplane was make-believe to begin with.

The EAA bomber is also a bit of a mutt because it no longer has its original solid

nose, which housed four .50-caliber machine guns and an enormous 75mm cannon. The Mitchell lost its pug-faced gun nose in 1952, while it was being modified for corporate use, and got a more attractive glass B-25J snout.

The restored B-25 will be joining the EAA's Living History program, flying around the country giving flight-experience rides and airshow demonstrations. Twenty- to 25-minute rides will cost around \$400, once the FAA paperwork is finalized this summer.

Coincidentally, a new Hulu six-episode remake of *Catch-22* premiered in mid-May, using two flying B-25s, a Douglas C-47, a Junkers Ju-52/3m and the inevitable computer-generated imagery of yet more airplanes. Despite some turbocharged talent—George Clooney as producer, director and cast member plus Kyle Chandler (*Friday Night Lights*) and Hugh Laurie (*Veep*)—the miniseries is a ponderously written, humorless comedy and drama-free drama.

Even the flying sequences are repetitious—seen one raid and you've seen 'em all—and the episodes serve up a steady stream of clangers. A Twin Beech 18 being loaded with cargo morphs into a C-47 on take-off...a crewman saluting and announcing that he is Lieutenant Newman bears bright sergeant's chevrons on his arms...the B-25s' flexible nose machine guns consist only of barrels, with no receivers and breech blocks inside the bombardier's compartment. If you need a B-25 fix, rent the original film.

Stephan Wilkinson

TOTAL IMMERSION

A visitor to the RAF Museum at Hendon participates in the Dambuster raid via virtual reality.



RAF HENDON DEBUTS DAMBUSTERS EXPERIENCE

Anyone wanting to discover what it was really like to take part in an iconic World War II bombing mission should visit the RAF Museum London at Hendon. Participants describe the newly launched "Dambusters: Immersive Histories Experience" as the nearest thing to stepping back in time.

Every effort has been made to ensure historical authenticity, with input from the official historian of No. 617 "Dambusters" Squadron. The aim is to bring alive the experience of the people involved.

Innovative virtual reality technology combines with a wooden mockup of an Avro Lancaster bomber cockpit to create a memorable experience. Participants don a special headset and vest. Within seconds, they are on board Guy Gibson's Lancaster as it carries out raids on Germany's Ruhr dams.

The floor and seats reverberate, aircrew can be seen at work, tracer lights arc through the sky, gunfire can be felt and the water in the dam reservoir is disturbingly close. Gibson gives orders over the intercom, and a nearby Lanc, *M-Mother*, is seen and felt exploding. Reaching out you feel the windows, fuselage and desk.

Jenny Elmes, a relative of *M-Mother's* pilot John "Hoppy" Hopgood, tried the experience. "It was brilliant and very realistic," she said. "Being able to stand up and look around made you feel you were really there. The gunfire from the dam is just how I imagined it...full on: *M-Mother* didn't stand a chance. To see the plane explode and fall at an angle to look like a bonfire was just how it must have been."

Angela Youngman



AIR QUOTES

"I INTEND TO BE THE GREATEST GOLFER IN THE WORLD, THE FINEST FILM PRODUCER IN HOLLYWOOD, THE GREATEST PILOT IN THE WORLD AND THE RICHEST MAN IN THE WORLD."

—HOWARD HUGHES



MILESTONES

MURDER IN THE SKIES

Canadian Pacific Air Lines Flight 108 (above) was 41 minutes into its trip from Quebec City to the small city of Baie-Comeau, 220 miles northeast, on September 9, 1949, when an explosion in the forward baggage hold sent the airplane, a Douglas DC-3, crashing to earth on the north shore of the St. Lawrence River. All 23 passengers and crew aboard were killed.

Canadian Pacific, which hadn't had a fatal accident since 1942, conducted a painstaking investigation. Chemical tests of the wreckage revealed traces of dynamite and a dry-cell battery, both essential ingredients in a time bomb. Attention soon turned to a middle-aged woman who took a taxi to the airport on the morning of the fatal flight and gave a fictitious return address while arranging to ship a large package aboard the airplane.

The taxi driver soon identified the woman, Marguerite Pitre, and details of a terrible plot quickly emerged. The mastermind was Pitre's close friend, 31-year-old J. Albert Guay, whose wife, Rita, was among those killed on the DC-3. Guay's motive in killing his wife was both to claim a life insurance payout and so he could more fully woo his teenage mistress. The other 22 people aboard Flight 108—victims of one of the first instances of airliner sabotage—were expendable red herrings intended to throw off investigators.

Guay had solicited the help of Pitre and her brother, a watchmaker who built the bomb, to commit the crime. The motives of Guay's accomplices have never been fully explained and, while it's possible the bomb maker's claims of innocence have some merit (he maintained he was told the bomb was for clearing tree stumps), all three were found guilty of murder and hanged.



J. Albert Guay



Marguerite Pitre

APOLLO BY THE NUMBERS

Apollo Program (not including Soyuz mission)

Number of missions into space: **11**

Number of Apollo astronauts: **32**

Number of astronauts who traveled to the moon: **24**

Number of missions to land on the moon: **6**
(Apollo 11, 12, 14, 15, 16 & 17)

Number of astronauts who walked on the moon: **12**

Cost of entire Apollo program: **\$25.4 billion** (\$144 billion in today's dollars)

Overall budget for the state of California, 2019: **\$144 billion**

Amount of moon rocks/soil returned to Earth: **842 pounds**

Total time astronauts spent on the moon: **299 hours, 30 minutes** (12½ days)

Longest time spent on the moon: **75 hours**, by Harrison Schmitt and Eugene Cernan of Apollo 17



FAR LEFT, FROM TOP: HISTORYNET ARCHIVE; (BOTH) BETTMANN/GETTY IMAGES; LEFT: NASA

B-52 RESURRECTED FROM THE BONEYARD

When Boeing B-52H 60-034 was mothballed at Davis-Monthan Air Force Base's "Boneyard" in 2008 after 17,000 flying hours, few could have predicted it would fly again. But when another B-52H burned up in a takeoff accident at Andersen Air Force Base on Guam in May 2016, plans were laid to use the bomber, dubbed *Wise Guy*, as its replacement. And when personnel from Davis-Monthan's 309th Aerospace Maintenance and Regeneration Group checked out the venerable plane, they found a prescient plea scrawled in the cockpit: "AMARG, this is 60-034, a cold warrior that stood sentinel over America from the darkest days of the Cold War to the global fight against terror. Take good care of her...until we need her again."

Time and Arizona desert heat had taken its toll. "The jet had cracks in the rear landing gear and was missing two engines," remarked Master Sgt. Steven Sorge of the 307th Maintenance Squadron at Barksdale AFB in Louisiana. "It also needed all its fuel cells and hoses replaced, as well as its tires." Components for the bomber's ejection systems were located in a five-gallon bucket. Still, with 13 to 20 people working on it at a time, *Wise Guy* was



NEW LEASE ON LIFE

Colonel Robert Burgess gives a thumbs-up (above) after delivering the B-52H *Wise Guy* (left) from Davis-Monthan AFB to Barksdale AFB in Louisiana on May 14.



prepared for a low and slow flight on May 14 to Barksdale, home of the 307th and 2nd Bombardment wings. It was the first B-52 to rise from the Boneyard since *Ghost Rider* in 2015. *Wise Guy*'s full restoration will take a total of 500 personnel and \$30 million to complete, with plans to return the bomber to service in early 2021.

NASA'S ADAPTIVE FLYING WING

From John W. Dunne's experiments in 1907 through the Jack Northrop aircraft that led to the B-2 bomber, some aviation designers have been enthralled with the flying wing as a means of using an aircraft's entire structure as a lifting surface. Since at least the 1930s, a variety of studies in variable geometry have taken to the air, seeking more speed, climb or efficiency by altering wing area, wingspan, angle of incidence, camber or sweep in flight.

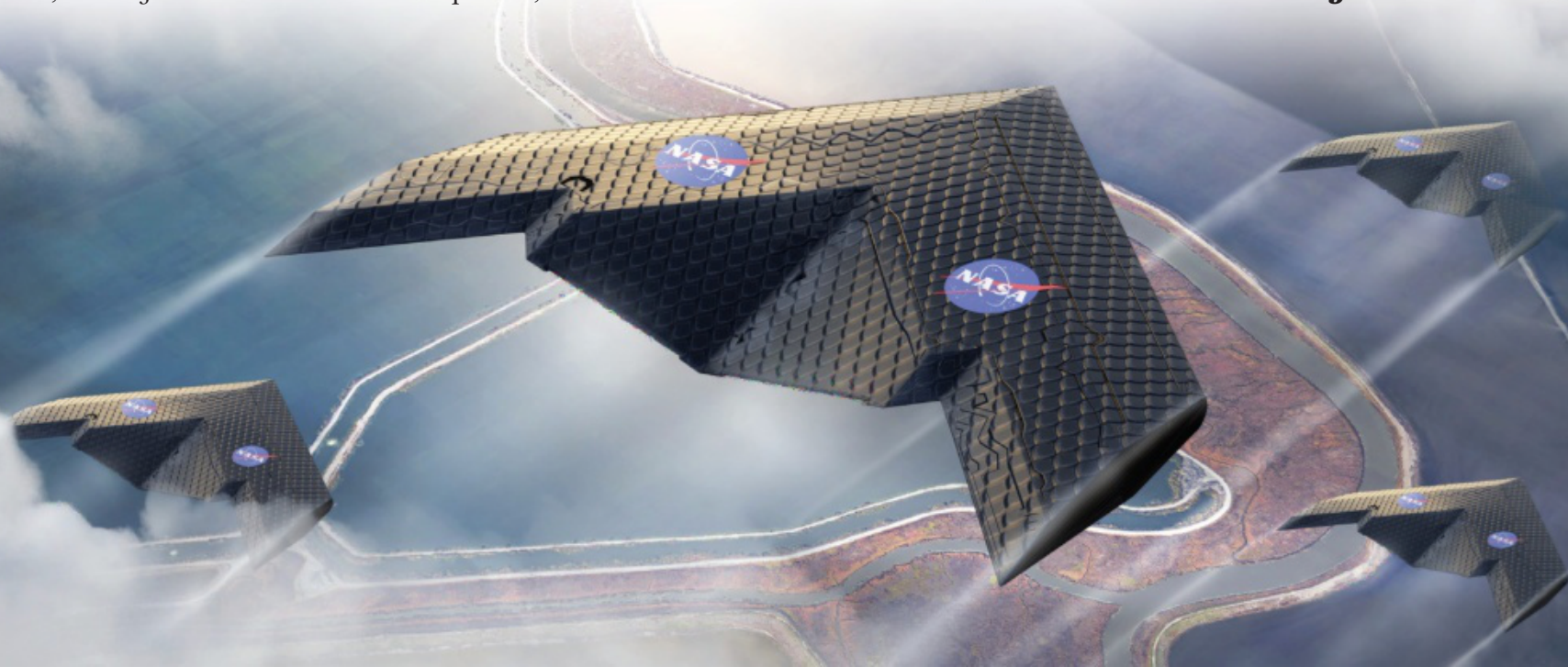
On April 1 researchers from the National Aeronautics and Space Administration, in conjunction with the

Massachusetts Institute of Technology, unveiled a wing that combines the flying-wing and variable-geometry concepts in one ultra-efficient lifting surface. A lattice structure of triangular struts incorporating hundreds of identical pieces with both rigid and flexible components, all covered in thin polymer material, this lightweight adaptive wing can morph on command into any configuration for a given flight situation—takeoff, cruising and landing—adding up to vast fuel savings. As was the case with wing warping on the earliest airplanes, but to a much more functional

degree, the wing can also be used to control flight, eliminating the need for rudder, elevators or ailerons.

During wind tunnel testing at Langley Research Center in Virginia, the adaptive wing reportedly performed better than expected. "We're able to gain efficiency by matching the shape to the loads at different angles of attack," said NASA research engineer Nicholas Cramer. In addition to airplanes, the NASA/MIT team envisions applications for airships, spacecraft and wing turbine blades.

Jon Guttman





AT HOME AND ABROAD

George Beurling mugs for the camera in Montreal (left), and shows off souvenirs from one of his Malta victories (above).

Canada's entry into World War II he sought to enlist in the Royal Canadian Air Force (RCAF), but was rejected because of his lack of education. Desperate to experience aerial combat, he crewed on a freighter to England. Finally, in September 1940, Beurling was accepted by the Royal Air Force (RAF). A year later, on September 9, 1941, he qualified as a pilot and earned his wings. In May of the following year he scored his first two victories, flying a Supermarine Spitfire Mk. Vb against Focke-Wulf Fw-190As.

Alongside Beurling's aerial skills and puritanical habits rode an irascible, arrogant and antagonistic alter ego. Fellow pilot Hugh Godefroy described him as "a tallish slim fellow with a disheveled crop of blond hair, sharp features and deep creases down each cheek.... He had large ice-blue eyes that rarely blinked." His squadron leader on Malta, Stanley Grant, described him as "high strung, brash and outspoken. He was a rebel." Beurling repeatedly refused promotions, and when finally

THE FALCON OF MALTA

"SCREWBALL" BEURLING TURNED INTO A STONE-COLD KILLER IN THE COCKPIT OF A SPITFIRE, BECOMING CANADA'S HIGHEST-SCORING ACE OF WORLD WAR II

BY BOB GORDON

In a few short weeks he downed 27 Axis aircraft. A deeply religious, nonsmoking teetotaler who eschewed profanity and possessed little more than a grade school education, George Beurling was obsessed with flying and shooting and confessed to love to partner his passions. Canada's most visible war hero in 1943 ruined his fundraising war bond tour by telling a reporter, "One of my can shells caught him in the face and blew his head right off....I must say it gives you a feeling of satisfaction when you actually blow their brains out."

The public knew him as "Buzz" Beurling, but his fellow airmen called him "Screwball." He first took the controls of

an airplane at 12, soloed at 14 and was licensed by 17. "Ever since I can remember," he later wrote, "airplanes and to get up in them into the free sky had been the beginning and end of my thoughts and ambitions."

In 1938 Beurling tried to get to China to join the air war over Manchuria. With

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— General Carl Spaatz, Commander, US Strategic Air Forces in Europe, 1944

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ordered to accept a flight lieutenant's commission, insisted on continuing to bunk with the sergeants.

He also simply could not resist hair-raising stunts to the point of courts-martial. While the base commander lectured a group of pilots about the absolute ban on dangerous pranks—a lecture inspired by Beurling's hijinks in the squadron's de Havilland Tiger Moth—Buzz “buzzed” the lecture hall. He regularly took his riggers and fitters for joyrides. On another occasion he shot a tail feather off Godefroy's pet duck. Beurling was a lone wolf who was constantly reprimanded for breaking formation. Discipline and accepting orders were never his strong suits. Only his public profile as an ace and a hero protected him from military justice.

By mutual agreement Beurling was one of the pilots selected for Operation Salient, and he was dispatched to Malta. He got his shot at aerial combat and the RAF got rid of a nuisance.

Malta amounted to a stationary, unsinkable aircraft carrier astride the supply chain from Italy to North Africa. As the Axis attempted to blockade and bombard Malta into ineffectiveness, Allied reinforcements arrived aboard the aircraft carrier *HMS Eagle*. Among them was Beurling, flying his Spitfire Vc to the Mediterranean island on June 9, 1942. For almost a month he was silent, without a victory, but then he embarked on a killing spree without parallel in the history of aviation.

On July 6 Beurling destroyed two Macchi C.202s, the Italian *Regia Aeronautica*'s best fighters, as well as a Messerschmitt Me-109F. On July 27 he hit the jackpot,



DOING HIS BIT

Above: Beurling (right) buys a Victory Bond in 1944. Right: The ace updates his score.

killing six-victory Italian ace Furio Niclot Doglio and downing his wingman, Faliero Gelli, who was taken prisoner. Beurling was also credited with two Me-109s that day, one piloted by German ace Karl-Heinz Preu, who was killed.

By October Beurling had been shot down on multiple occasions. Afflicted with dysentery and underweight, he was finally forced out of the fight by a serious shrapnel wound in the heel. Remarkably, on the return flight to England, he was one of only three to survive when their Consolidated Liberator overshot the runway at Gibraltar. For the next year he fulfilled a variety of noncombatant tasks, from a Victory Bond tour of Canada he regretted to a stint at a gunnery school he reveled in.

A handful of outrageous incidents alone establish his extraordinary talents.

Beurling loved flying right on the deck, and he swore he did it best inverted. He argued that the blind spot created by the cowling was eliminated when the aircraft was upside down.

Squadron intelligence officer Monty Berger recalled



Beurling's account of spotting an enemy Fw-190 and shooting it down in the fall of 1943, when he was with No. 403 Squadron, RCAF. “I knew that if I said anything on the R/T [radio telephone] the chances of our whole section turning around quickly enough weren't very good,” Beurling told him. “That spot would have disappeared. So I peeled off, climbed and got behind him. I was to his left and behind, and I could see my shots going into the rear of his cockpit. The FW went down in flames.”

“By golly, the [gun camera] film clearly showed the aircraft being shot down,” Berger said. “He had spotted this dot, peeled off, got behind it and got back into position without anybody knowing what had happened.”

By the time the war ended,

Screwball Beurling wore the Distinguished Service Order, Distinguished Flying Cross, Distinguished Flying Medal & Bar and was credited with 31 victories. Unable to adapt to civilian life, he yearned for dogfighting. “I would give 10 years of my life to live over again those six months I had in Malta in 1942,” he told a reporter, adding, “...combat, it's the only thing I can do well; it's the only thing I ever did that I really liked.”

He contracted to Israel to fly P-51 Mustangs in 1948. En route, with fellow Malta pilot Leonard Cohen, their Noorduyt Norseman crashed on takeoff from Rome, killing them both.

RAF ace James “Ginger” Lacey summed it up: “There are no two ways about it, he was a wonderful pilot and an even better shot.” ✚

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RUSSIAN FRONT "WHITE 9"
Air Leasing's HA-1112-M1L C.4K-105, painted in the markings of German ace Edmund Rossmann, flies from Sywell Aerodrome in 2018.

MOVIE MESSERSCHMITTS

SPANISH-BUILT VERSIONS OF THE ME-109 LEND AN AIR OF AUTHENTICITY TO WORLD WAR II FEATURE FILMS

BY JON GUTTMAN

If ever a pair of warbirds owed much of their survival to the film industry, it is the Supermarine Spitfire and the Messerschmitt Me-109—or more often in the latter case, its stand-in, the Hispano Aviación HA-1112 *Buchón*. Ever since the 1969 Hollywood epic *Battle of Britain* (story, P. 44), these perpetual adversaries have been kept flying to awe crowds at airshows and to be ready to dogfight again the next time a World War II movie project comes around, most recently 2017's *Dunkirk*.

After *Battle of Britain*, 16 *Buchóns* were presented in lieu of payment to the film's chief stunt pilot, Wilson "Connie" Edwards, who traded two back to the production company for a Spitfire Mk. IX and kept the remainder at his ranch in Big Spring, Texas. Over the years he sold off his Spanish Messerschmitts, some ending up in museums either in their original form or modified to look more like Me-109s, others restored to flying status. In 2015 Edwards sold the last six of them to Air Leasing Ltd. in Sywell, Northamptonshire, England. Three of those recently returned to the air in rapid succession.

The Me-109's Spanish connection dates back to its use by the German Condor Legion during the Spanish Civil War, after which some were sold to the victorious Nationalist regime of General Francisco Franco Bahamonde. In 1942 Hispano Aviación obtained a licence to produce Me-109G-2s, and its version had undergone several changes in engine, armament and overall configuration by the time the HA-1112-M1L made its first flight on March 29, 1954. Powered by a Rolls-Royce Merlin 500-45 engine driving a Rotol propeller—both British imports more readily associated with its enemy, the Spitfire—the HA-1112 had a maximum speed of 413 mph, respectable for a 109 but irrelevant in view of its primary role, patrolling



Spain's North African colonial territories during the jet age. By the time of its retirement in December 1965, the *Buchón's* future had already been presaged in 1957, when an HA-1112-K1L (a 1951 version using a Hispano-Suiza engine) portrayed the Me-109F of German ace Hans-Joachim Marseille in *Der Stern von Afrika*.

When filming began on *Battle of Britain*, producer Harry Saltzman bought eight of the retired Merlin-powered HA-1112s from the Spanish government, plus enough parts to build 20 more. Edwards flew the lead Spitfire and assembled what

ONE-OF-A-KIND TRAINER
Wilson "Connie" Edwards stands beside the rare HA-1112-M4L two-seater, shown landing, opposite.

he called "a squadron of bush pilots" to operate the others. As the filming went over budget, many scenes had to be recycled (as anyone who sees the movie multiple times will notice) and Edwards was offered the HA-1112s as payment. Already wealthy from the oil business, he said, "Fine, I'll take the aircraft as IOUs," dismantled them and shipped the crated fuselages, wings and tail units to his ranch in Texas.

Between Edwards' care and the arid weather conditions where they were stored, the *Buchóns* remained remarkably well preserved over the decades, down to their original movie warpaint. When Air Leasing got around to restoring the most recent trio in 2017, it found little repairing or replacing to do aside from a basic overhaul.

The first of the three to regain flying status, in November 2017, was HA-1112-M4L serial no. C.4K-112, the sole *Buchón* built as a two-seat, dual-control trainer (although one of the fighters was modified with a bubble canopy for the air-to-air photography). During the filming two actual Battle of Britain aces, Adolf Galland and Robert Stanford Tuck, got to fly in the two-seater. Since the HA-1112-M4L's recent return to flight, Air Leasing Ltd. has been offering rides in it to the general public.

HA-1112-M1L C.4K-99 was next to fly, in April 2018, bearing Battle of Britain livery and the yellow numeral 7. The latest, HA-1112-M1L C.4K-105, made its first takeoff in more than 50 years from Sywell Aerodrome in June 2018. Its markings scheme is based on that of Me-109F-4 "White 9" flown by 93-victory ace Edmund



WELL PRESERVED

Edwards' *Battle of Britain* film veterans required very little restoration work.

Rossmann of *Jagdgeschwader* (fighter wing) 52 over Russia in September 1941.

Prior to the latest trio, several earlier buyers had made their *Buchóns* airworthy. C.4K-67 was restored by Spitfire Ltd. and currently resides at St. Helier on the Channel Island of Jersey. The Messerschmitt Foundation obtained an original Daimler-Benz DB 605 engine and in 2004 completed C.4K-75 as an Me-109G-4 for airshow appearances in Germany (with a small red, gold and black national flag on the vertical stabilizer in place of the Nazi swastika).

MaierMotors also converted C.4K-64 to Me-109G-4 configuration with a DB 605 engine. It returned to flight in August 2015, and now operates from Jerry Yagen's Military Aviation Museum in Virginia Beach, Va. C.4K-130 had an Allison engine with a Douglas DC-3 propeller installed inside a cowl resembling that of an Me-109G-10, and now flies with the Erickson Aircraft Collection out of Madras, Ore. C.4K-172, sporting the markings of Galland's Me-109E during the Battle of Britain, is currently based at the Cavanaugh Flight Museum in Addison, Texas.

The latest of Edwards' *Buchóns* to "see action" on the silver screen was C.4K-102, which returned to

England in 1993 after being sold to the Real Aeroplane Company. After an extensive restoration, in 2006 it was sold to Spitfire Ltd. and in 2016 to Historic Flying Ltd., which hangs the fighter at Duxford. In 2017 C.4K-102 was cast in *Dunkirk*.

Sadly, Connie Edwards' remarkable thrill-filled life came to an end on May 3, 2019, at age 85. Having been "shot down" 72 times in Spitfires and 128 times in *Buchóns* during filming of *Battle of Britain*, he once said, "I've probably lived more lives than anybody I know." Part of his continuing legacy are three more airborne Spanish Messerschmitts, ready to help fill out a *Staffel* of "bad guys" for the next airshow or cinematic dogfight. ✚





AEROFLOT'S INTERCONTINENTAL GIANT

DEVELOPED FROM THE TUPOLEV TU-95 "BEAR" STRATEGIC BOMBER, THE TU-114 ROSSIYA AIRLINER SET RECORDS AS THE WORLD'S FASTEST TURBOPROP AIRCRAFT **BY ROBERT GUTTMAN**

The peculiar passion that Russians seem to harbor for huge aircraft can be traced all the way back to 1913, when Igor Sikorsky built the Russky Vityaz, the world's first four-engine airplane and the largest in the world at that time. Their enthusiasm for giants continued into World War I, with the production of Sikorsky's four-engine Ilya Muromets, and persisted throughout the Soviet era. While many Soviet designers created gargantuan airplanes, the most consistently successful ones originated from the design bureau headed by Andrei Tupolev.

For more than 60 years Tupolev remained one of the most influential Russian aircraft designers in spite of being twice arrested for subversive activities—once by the Tsarist regime and once by the Soviets. In fact, Tupolev actually developed his highly successful Tu-2 medium bomber while imprisoned for treason by Josef Stalin during World War II.

After Stalin's death in 1953, a relative thaw began in Soviet-Western relations. Unlike Stalin, Premier Nikita Khrushchev was willing to travel abroad in order to confer with his Western counterparts. He also sought to publicize Soviet technological achievements to the rest of the world. The accomplishment of those objectives, however, would require the development of a suitably prestigious transport aircraft, which at that time did not exist in the Soviet Union. That deficiency was emphasized during Khrushchev's arrival at the 1955 summit in Geneva in an Ilyushin Il-14. While a perfectly adequate twin-engine airliner, the Il-14 was overshadowed by President Dwight D. Eisenhower's sleek four-engine Lockheed Super Constellation *Columbine III*.

The Soviet Air Ministry turned to Tupolev, issuing a speci-

fication for a large, fast transport with a range of 8,000 kilometers (4,971 miles). Tupolev had already developed a successful jet-powered airliner, the Tu-104, but it was designed to fly only moderate distances and was not suitable for transoceanic flights. Tupolev's solution was to develop an airliner—the Tu-114—from his Tu-95 "Bear," the first Soviet strategic nuclear bomber with true intercontinental range.

It was not a particularly original idea. Boeing had already developed its 307 Stratoliner and 377 Stratocruiser airliners from its B-17 and B-29 bombers, respectively, while Avro developed its Lancastrian and Tudor airliners from its Lancaster bomber.

The Tu-114 featured an entirely new fuselage with a pressurized cabin that could accommodate up to 224 passengers. The 35-degree

swept wing was relocated from the high-wing position used on the Tu-95 to a low-wing position on the airliner. An entirely new tail and stabilizer were also designed. Power was provided by four Kuznetsov NK-12MV turboprop engines driving contra-rotating propellers, each delivering 14,795 hp. The resulting aircraft had a wingspan of 168 feet, a length of 178 feet and a takeoff weight of 385,809 pounds. Its maximum speed was 541 mph and it cruised at 478 mph, with a maximum range of 5,244 miles.

Concurrent with the Tu-114, Tupolev also developed another passenger-carrying version of the Tu-95, the Tu-116. Its official purpose was "to conduct route and scheduling studies, propulsion system tests and study compatibility issues with civil airports." In reality, however, it was intended to



WELCOME, COMRADES
Passengers disembark from an Aeroflot Tupolev Tu-114 at Domodedovo Airport in Moscow.



TOWERING ACHIEVEMENT

Above: The Tu-114 prototype stands 50 feet tall. Right: Andrei Tupolev smiles next to his creation.



the aircraft performed satisfactorily throughout the long excursion.

The Tu-114 certainly created a splash in the U.S. It was the largest airliner in the world at the time, and though not quite as fast as the new Boeing 707 and Douglas DC-8 jetliners, was very nearly as fast, while being able to carry a significantly larger payload over a considerably longer distance. In fact, the Tu-114 set several speed, altitude and payload records for turboprop-powered aircraft that still stand to this day. It has held the Fédération Aéronautique Internationale's world speed record for propeller aircraft in a closed circuit since 1960.

Having so dramatically proven itself, the Tu-114 entered commercial service in April 1961, with a total of 32 eventually built. It remained the flagship of the Soviet airline Aeroflot until 1971, when it began to be superseded by the Ilyushin Il-62, a large airliner with four jet engines mounted beneath its tail, bearing a suspicious resemblance to Britain's Vickers VC-10. Although displaced from

international routes, Tu-114s continued in domestic commercial service until 1976, leaving behind an enviable safety record. Only one was ever involved in a fatal accident, and that occurred when the pilot tried to take off from a runway that had not been properly cleared of snow. Its principal fault lay in the engines—the most powerful turboprops were also among the noisiest.

After their commercial career ended, about a dozen Tu-114s were modified into airborne early-warning platforms. Redesignated Tu-126s, the AWACS versions of the Tu-114 remained in service until 1990, and one is known to have been transferred to the Indian Air Force. ✈



serve as a hedge against the possible failure or protracted development of the Tu-114. The Tu-116 involved a far less extensive redesign of the Tu-95, utilizing the bomber's existing fuselage with the addition of relatively small pressurized passenger cabins fore and aft of the wings, the latter accessed via a folding ladder beneath the tail. But within a few months of the Tu-114's successful first flight on October 3, 1957, it became apparent that the Tu-116 would be unnecessary, so only two examples were ever completed.

The Tu-114 was displayed at the Brussels World Exhibition in 1958. Then, despite

JET-FAST TURBOPROP

With a top speed of 541 mph, the Tu-114 was nearly as fast as jetliners of the era.

the misgivings of many aeronautical engineers about the employment of a still-experimental aircraft for such a purpose, Khrushchev insisted upon flying in it for his September 1959 visit to the United States. Since worrisome hairline cracks had appeared in the engine nacelles, special engineers accompanied Khrushchev's party and every Soviet warship in or near its flight path stood at full alert in case anything went wrong. Fortunately for all concerned,

The Right Stuff

Freewing's F-16C Super
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AVIATION
HISTORY

STYLE

We take the controls of the Freewing F-16C RC jet, check out Hulu's new series *Catch-22* and check into JFK Airport's new TWA Hotel.

MODEL AIRCRAFT

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STYLE

MODEL AIRCRAFT

Pilots Wanted

Advanced RC pilots will appreciate the Freewing F-16C jet's special features, such as its scale operating, CNC-machined 6061 aluminum landing gear with shock-absorbing struts; completely removable wings, stabilators, vertical stabilizer and nose cone for easy transport; bright LED navigation lights for enhanced realism and dawn/dusk maneuvers; and a pre-installed afterburner. Additional scale details of the model—officially licensed by Lockheed Martin—include a tinted canopy with a detailed plastic cockpit and an armament set with easy detachment design. Comes powered by a 12-blade factory balanced EDF motor with realistic jet turbine sound. *Freewing F-16C Super Scale 90mm EDF Jet - PNP*, \$529, motionrc.com

Wingspan: 40.27 inches
Length: 59.92 inches



VIDEOGRAPHY

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PHOTOS COURTESY OF MOTIONRC.COM

STYLE

ENTERTAINMENT

Catch-22

Executive producer George Clooney and Hulu recently premiered the six-episode series **Catch-22**. Based on Joseph Heller's novel, it's the story of John Yossarian (Christopher Abbott), a U.S. Army Air Forces bombardier in World War II who is stymied at all turns by military bureaucracy.

Yossarian learns that avoidance of his military assignments will result in a violation of "Catch-22," a twisted rule that states a man is considered insane if he willingly continues to fly dangerous combat missions, but a request to be removed from duty is considered evidence of sanity and therefore makes him ineligible to be relieved from duty. The all-star cast includes Clooney, Abbott, Kyle Chandler, Hugh Laurie and Giancarlo Giannini.

Yossarian, played by Christopher Abbott, in Hulu's Catch-22.



Abbott, Pico Alexander, George Clooney and Lewis Pullman in Catch-22

STYLE

Under the Constellation

A restored 1958 Lockheed L-1649A is parked in front of the TWA Hotel. The plane's interior has been transformed into a cocktail lounge.



Saarinen's Swan Song

Finnish-American architect Eero Saarinen designed the futuristic thin-shell concrete TWA Flight Center from 1955 to 1957. It was completed and dedicated on May 28, 1962. Sadly, Saarinen died the year before its completion.



TRAVEL

Hotel Lands at JFK

On May 15, after sitting dormant for nearly 20 years, the Eero Saarinen-designed TWA terminal at New York's JFK International Airport reopened as the **TWA Hotel**.

JFK's only airport hotel features 512 ultra-quiet guestrooms, the Paris Café by celebrated chef Jean Georges, 50,000 square feet of event space, a rooftop pool and observation deck, and a 10,000-square-foot fitness center. The hotel also plans to host museum exhibitions on TWA, the jet age and mid-century modern design, curated by the New-York Historical Society.
twahotel.com



Flight Deck

TWA Hotel's infinity pool, bar and observation deck offer views of JFK's runways.





THE GREAT BIRD OF THE GALAXY

BY CARL VON WODTKE

To legions of fans worldwide, Gene Roddenberry was defined by the incredibly successful television and movie franchise he created. So far the *Star Trek* universe has spawned seven TV series and 13 feature films, with no end in sight. Few know, however, that before he took up screenwriting in Hollywood, Roddenberry served as a B-17 pilot during the Pacific War, narrowly escaping death on at least two occasions (story, P. 36). In this issue we also delve into the world of military aviation as imagined by Hollywood, with features on Howard Hughes' World War I epic *Hell's Angels* (P. 60), 1969's *Battle of Britain* (P. 44) and jet age films featuring the U.S. Air Force (P. 52).

In 1960 Roddenberry pitched an idea to Screen Gems for a TV series with the working title *The Wild Blue*. "It has been almost sixteen years since I left the South Pacific," he wrote in a memo to the head of Screen Gems, recounted in David Alexander's biography *Star Trek Creator*. "In the interval, I've felt winter-pangs about certain experiences down there, a certainty that there are wonderful stories hanging undeveloped, which could contain that wonderful melding of humor and tragedy which has characterized all truly great stories of men in conflict with themselves and their surroundings." The show was about the trials and tribulations of a worldly-wise B-17 pilot, Captain Phillip Pike, in "a half-assed, ex-recon squadron, flying rickety B-17s in the early days of the Pacific War." It was ultimately named *APO 923* and a pilot episode was filmed in 1961. Although CBS didn't pick

up the program, its main character would live on as Captain Christopher Pike in the *Star Trek* pilot and then be reimagined as Captain James T. Kirk. Secondary characters Lieutenants Edward Jellicoe and James T. Irvine would serve as models for *Star Trek's* Dr. McCoy and Mr. Spock.

Roddenberry died in 1991, and today his son, Eugene "Rod" Roddenberry Jr., is the main keeper of his legacy. Asked what has made *Star Trek* so enduring, Rod points to the show's Vulcan philosophy of IDIC—infinite diversity in infinite combinations. "It's the idea that in *Star Trek* they weren't out traveling the galaxy to find weird-looking aliens, they were seeking out new ideas," he says. "We as a species had come together...as we realized that it's the uniqueness between us that makes us special, that makes life interesting and that allows us to grow intellectually." *Star Trek* "gives people hope and shows a future where we work together and unconditionally love one another. And that's not make believe; that's possible."

That idea might seem quaint in today's volatile world, but don't forget that *Star Trek* debuted with its multi-ethnic cast in 1966, another time of serious social and political upheaval. "*Star Trek* is needed now more than ever," says Rod. With his establishment in 2011 of The Roddenberry Foundation, he has sought to honor his father's legacy by backing "organizations, institutions and individuals that are working toward long-term advancement of our species." The foundation's most recent award was a \$1 million grant to Project Drawdown, an organization dedicated to reversing global warming. Learn more at roddenberryfoundation.org. ✚

FINAL FRONTIER

Top: Gene Roddenberry (in brown suit) and *Star Trek* cast members attend the September 1976 rollout ceremony for the space shuttle *Enterprise*. Above: Roddenberry enlisted in the U.S. Army Air Forces on December 18, 1941, and flew B-17s in the Pacific.

ABOVE: NASA; INSET: COURTESY OF RODDENBERRY ENTERTAINMENT

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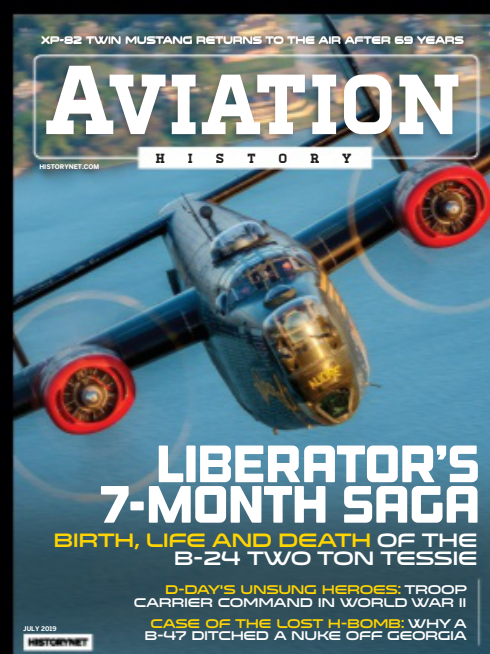
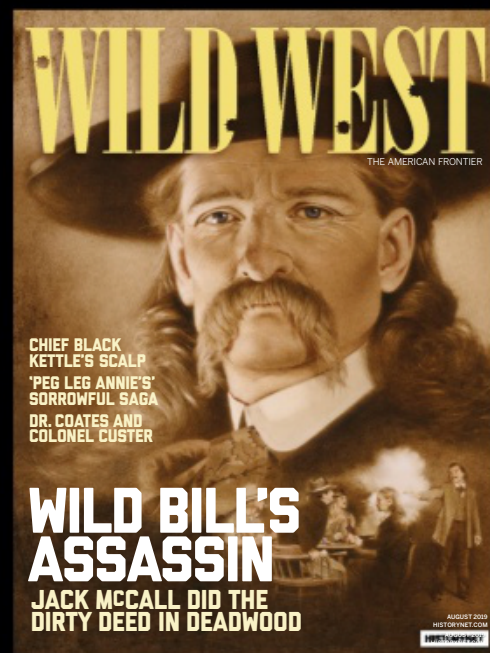
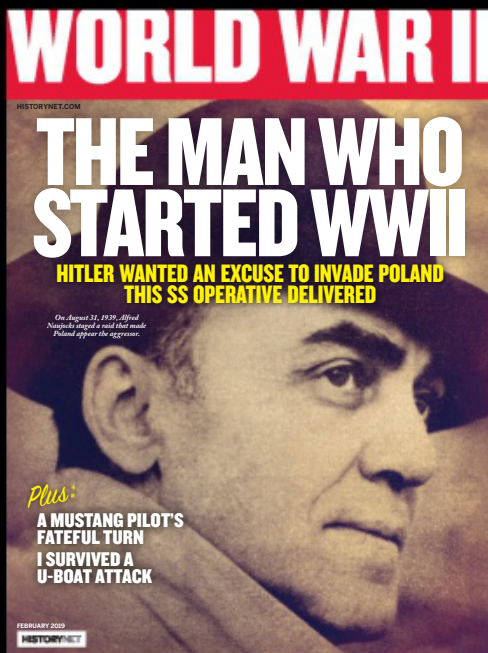


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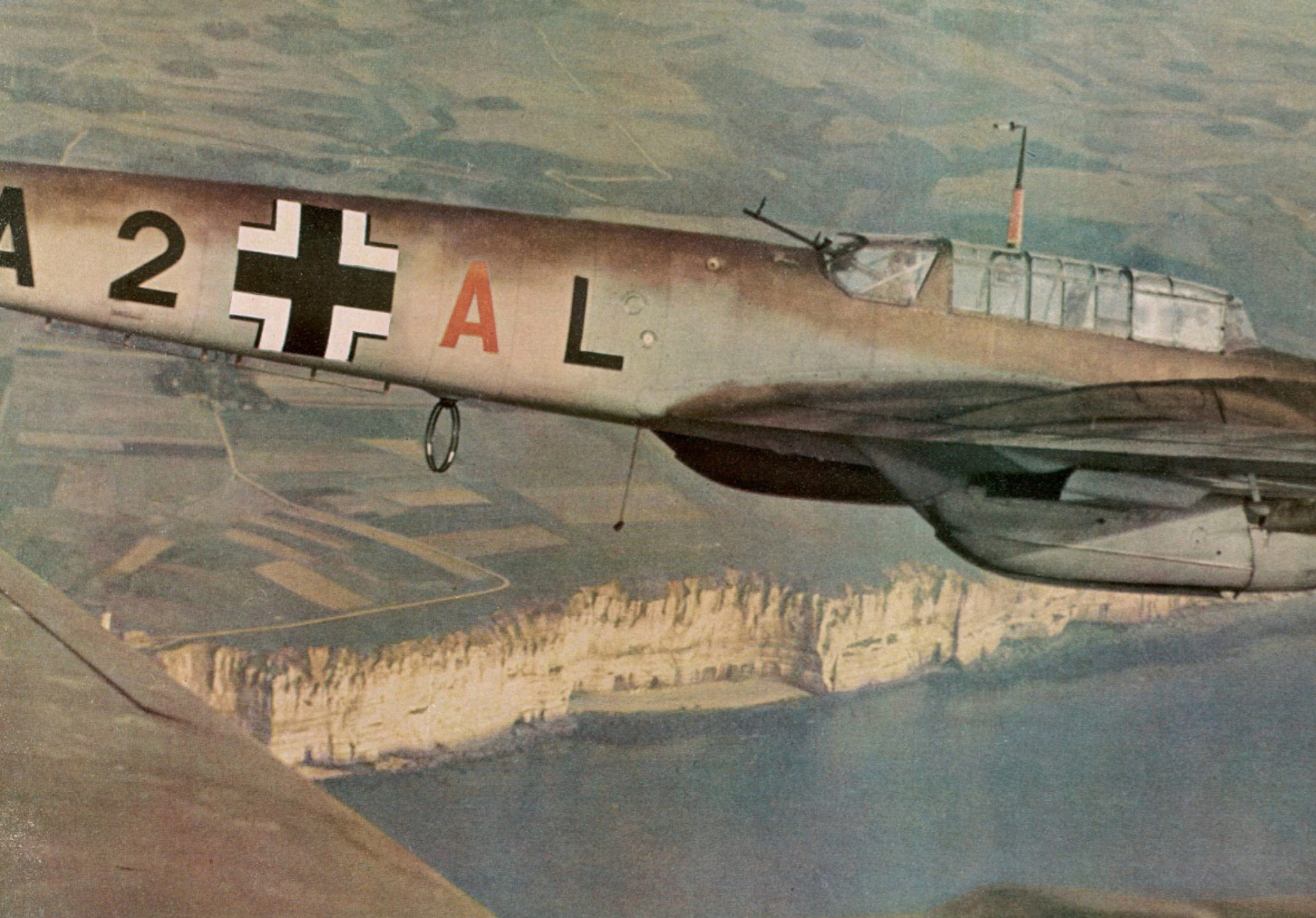
NIGHT TERROR

THE MESSERSCHMITT ME-110 "DESTROYER" WAS SHOT DOWN IN DROVES DURING THE BATTLE OF BRITAIN, BUT IT WENT ON TO BECOME WORLD WAR II'S MOST SUCCESSFUL NIGHT FIGHTER BY STEPHAN WILKINSON



DEADLY "SLANTED MUSIC"

A radar-equipped Messerschmitt Me-110G-4 uses its upward-firing *Shräge Musik* 20mm cannons to shoot down an Avro Lancaster, in an illustration by Adam Tooby.



DURING THE 1930S, THE CONCEPT OF A “HEAVY FIGHTER” CAME INTO VOGUE. AIR COMBAT WAS STILL IN ITS FORMATIVE YEARS, AND AIRCRAFT DESIGNERS BELIEVED THAT FOUR-ENGINE BOMBERS WITH ENOUGH GUNS TO MAKE THEM “FLYING FORTRESSES” WOULD BE UNSTOPPABLE.

EASY MEAT

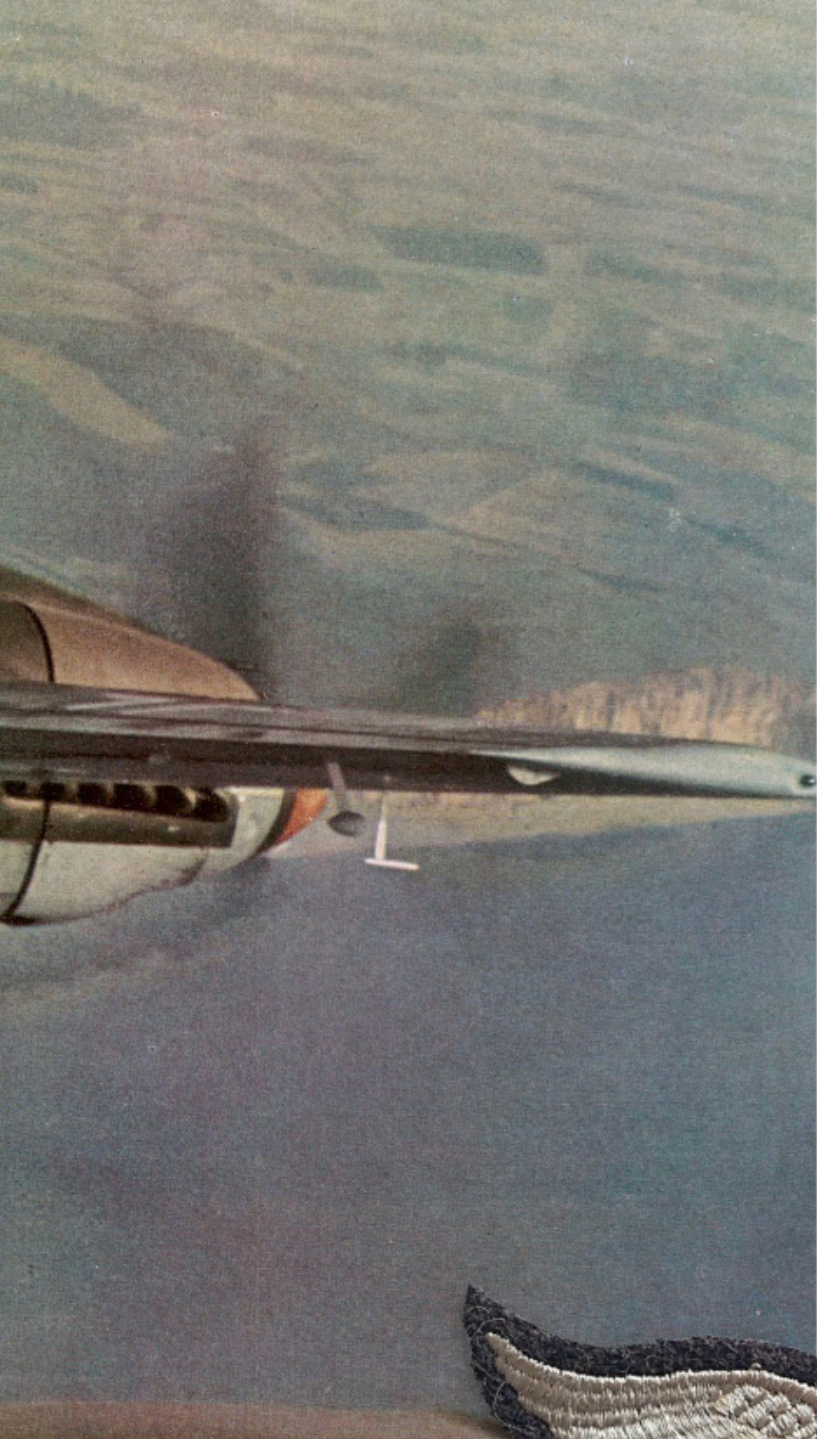
An Me-110C passes Dover during the Battle of Britain, when many of the twin-engine fighters were shot down by Spitfires and Hurricanes.

Gloster Gladiator biplanes had yet to give way to Supermarine Spitfires and Hawker Hurricanes, so the idea of a large, twin-engine fighter with overwhelming firepower that could both protect bombers and blast a path for them seemed to make sense.

Many pursued the idea: the Dutch with the Fokker G-1, the Soviets with the Petlyakov Pe-2 and -3 and the British with the Bristol Beaufighter. The Americans came up with both the uniquely

successful Lockheed P-38 and the useless Bell YFM-1 Airacuda. The P-38 Lightning was a success because from the outset it was intended to be a fighter, though it later undertook other roles, such as reconnaissance. Most heavies were designed as multirole aircraft, which inevitably compromised fighter performance.

Two late-war heavy fighter designs, Germany's Dornier Do-335 *Pfeil* centerline-thrust twin



and the North American F-82 Twin Mustang, were particularly sophisticated responses to the concept, especially the Do-335. Had the Dornier ever been produced in quantity, it would have been a fearsome weapon.

Initially, Germany's heavy fighter was to be a fighter/destroyer—*Kampfzerstörer*, a generic Luftwaffe term (soon shortened to *Zerstörer*) for an airplane that could be launched to beat back hordes of attacking bombers. The unproductive bomber-escort function of the heavy fighter came later, after the surprisingly shortsighted Germans realized they were going to have to go to war with Britain but didn't have bomber escorts with the range to cross the Channel.

The hammer in the Germans' heavy fighter toolbox was the Messerschmitt Me-110, a frequently maligned design that in fact was an effective weapon from the beginning of Adolf Hitler's Polish blitzkrieg until the very last days of the war. "Oh, that's the bomber escort that was so lousy it needed an escort itself," somebody is sure to respond. Well, yes, just as Hurricanes needed Spitfire escorts while they concentrated on shooting down Heinkels, or bomb-laden Republic F-105s over Vietnam were happy to have McDonnell Douglas F-4s hanging around.

The missing ingredient in the heavy fighter formula was maneuverability. Nobody could roll

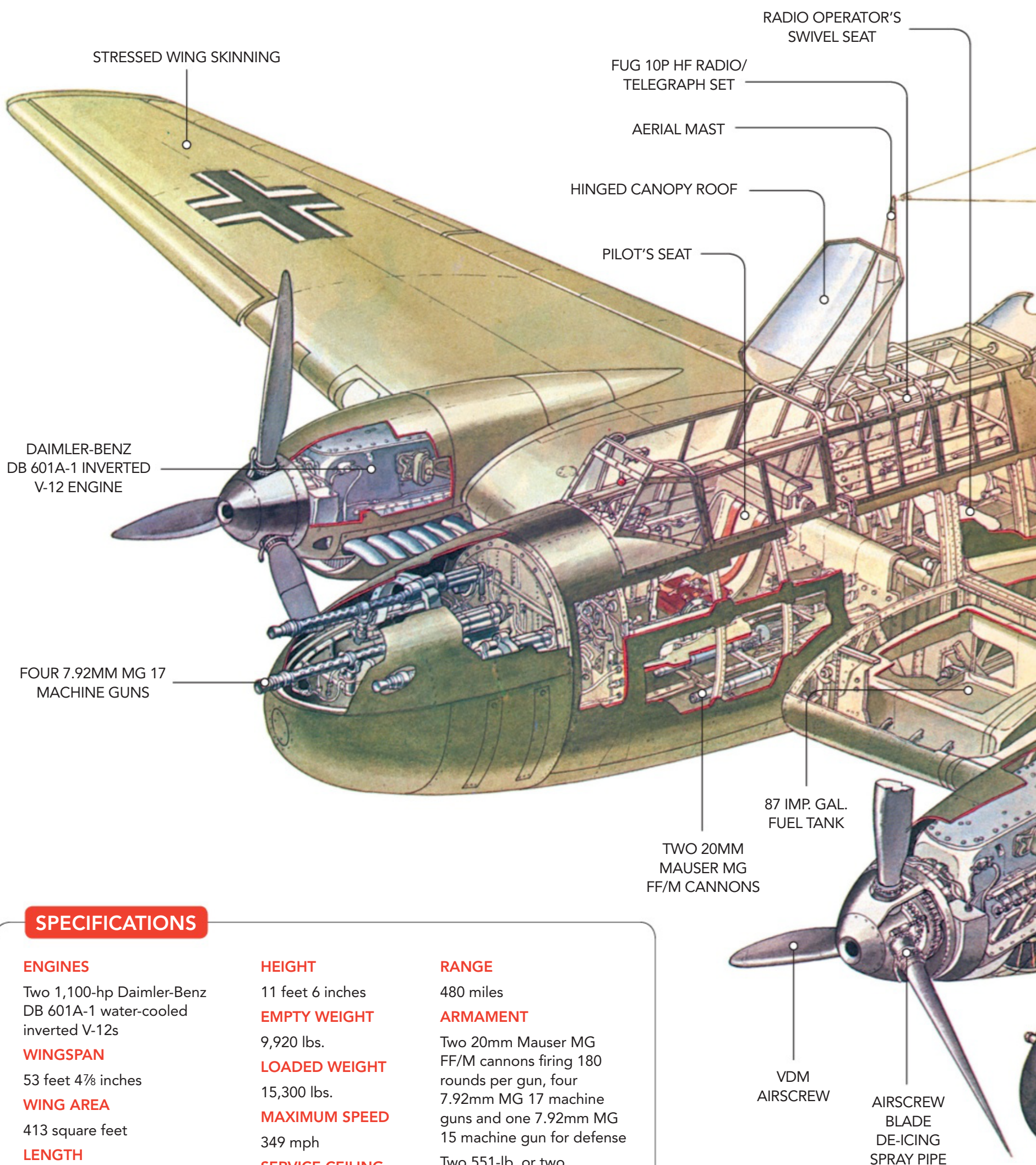
or turn an airplane as fast as a single-engine fighter when it had two big V12 engines weighing down its wings. And to make matters worse, the Me-110 had particularly heavy controls. Even the strongest pilots tired rapidly during serious maneuvering. "Pulling out of a dive required the strength of an ox," said one Luftwaffe test pilot. "It was inconceivable to me how such an escort fighter could ever have gone into production."

Though the 110 had substantial firepower in its nose—typically four 7.92mm machine guns and two 20mm cannons, with a variety of even heavier weapons hung on later marks—it was too often pursued from astern, an area covered by a single hand-operated machine gun. The ultimate Me-110, the G model, got a brace of more effective rapid-fire twin Mauser tail guns.

During development of the Bf-110 (as all subtypes designed for the Bayerische Flugzeugwerke prior to July 1938 were designated), test pilot Hermann Wurster flew the prototype in demonstration dogfights against Ernst Udet, in a Bf-109. Perhaps the 110 was carrying minimum fuel and no ordnance, because it reportedly could fly just

BETWEEN MISSIONS

Me-110C crewmen discuss the battle over lunch at an airfield in France in 1940 before returning to the fray.



SPECIFICATIONS

ENGINES

Two 1,100-hp Daimler-Benz DB 601A-1 water-cooled inverted V-12s

WINGSPAN

53 feet 4 $\frac{7}{8}$ inches

WING AREA

413 square feet

LENGTH

39 feet 8 $\frac{1}{2}$ inches

HEIGHT

11 feet 6 inches

EMPTY WEIGHT

9,920 lbs.

LOADED WEIGHT

15,300 lbs.

MAXIMUM SPEED

349 mph

SERVICE CEILING

32,800 feet

RANGE

480 miles

ARMAMENT

Two 20mm Mauser MG FF/M cannons firing 180 rounds per gun, four 7.92mm MG 17 machine guns and one 7.92mm MG 15 machine gun for defense

Two 551-lb. or two 1,102-lb. bombs

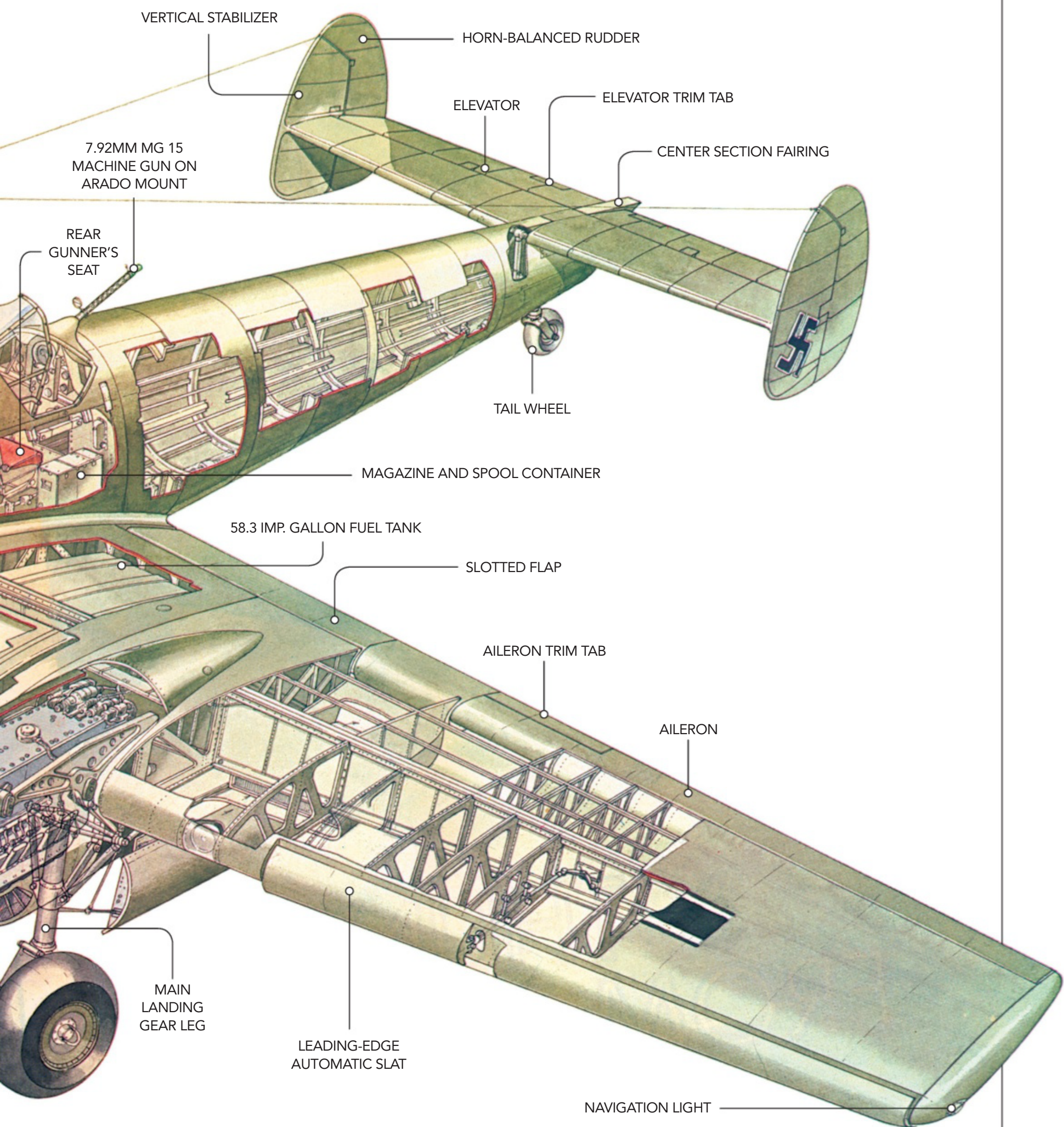


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MULTIROLE TWIN
Top: Personnel at a North African airfield in 1942 remove the camera from an Me-110E modified for reconnaissance. Above: The shark-teeth motif of II Gruppe, Zerstörergeschwader (ZG) 76, was copied by No. 112 Squadron, RAF, and subsequently adopted by the American Volunteer Group "Flying Tigers."

as tight a turn as the single-seater and refused to stall even during the steepest turns. Bf-109/110 dogfights were also staged for important foreign visitors and potential export buyers, with German national aerobatic champion Willi Stör flying the unbeatable 110, which he proclaimed was the best twin-engine aerobat on the planet. Apparently, somebody had a thumb on the scale.

Willy Messerschmitt was never a popular designer among his peers, and Erhard Milch, who was in charge of aircraft production for the Luftwaffe, outright hated him. Messerschmitt was only allowed into the competition for the proposed mid-1930s heavy fighter contract because of his influential friend Udet, the World War I ace and aerobatic champion, who at the time was in charge of Luftwaffe R&D. Some historians even believe the 110 was intended to fail from the outset, and that when Milch approved the unpromising project in 1934, he meant for the 110 to sink Messerschmitt once and for all.

Messerschmitt's brief initial Bf-110 design concept was an F-82-style twin 109 with two enlarged fuselages. He soon switched to an all-new design—only the second military airplane he had created—with a slender, tapering fuselage, twin tails and a long, protruding canopy. The substantial greenhouse and cockpit would become an asset when the initial two-man crew—pilot and rear gunner/radio operator—grew to three as the 110 found its niche as a night fighter and needed space for a radar operator.

The actual functional designers of the 110 were project chief Robert Lusser and engineer Walter Rethel; Messerschmitt himself was still busy with the Bf-109. His company was also going through a management reorganization, which led to a lack of critical oversight during the design's early stages.

First flight took place in May 1936, with Bayerische Flugzeugwerke chief pilot Wurster in the cockpit. Many sources claim that Rudolf Opitz was the pilot, but Opitz's logbooks, today in the possession of his son Michael, show that he was not at Augsburg on that day, nor did he have a multiengine rating at the time. Opitz would go on to make the first powered flight of the horrifically dangerous Me-163 rocket plane.

As was his wont, Messerschmitt had ignored the Reich Ministry of Aviation's request-for-proposal provisos and followed his own path in engineering the Bf-110. Two of his guiding principles were lightness in aid of the highest possible performance, and simplicity to support ease of construction. It remained a concern throughout the production life of the airplane, though, that two 109s could be built for the cost of a single 110.

Reichsmarschall Hermann Göring, ever the romantic, loved the idea of swarms of gaudily painted *Zerstörers* carving their way through the skies. He considered the Me-110 more important than the 109 and bled off some of the best single-seater pilots to man his questionable fleet, which distressed the Luftwaffe. The paint lived on, though. The shark's-teeth motif of II Gruppe, *Zerstörergeschwader* (destroyer wing) 76, first seen over France in 1940, was copied by the Royal Air Force's No. 112 Squadron for its Curtiss Tomahawks and quickly adopted by the American Volunteer Group "Flying Tigers" as well. The design passed into history as Flying Tiger leader Claire Chennault's invention.

In an odd precursor to the stolen-MiGs episodes of the Cold War, in May 1939 an ex-Luftwaffe pilot, Franz Öttil, stole an Me-110 from Augsburg and tried to fly it to France. Öttil had been cashiered from the air force for flying a biplane trainer into the roof of his family's farm during a buzz job. He successfully flew the Messerschmitt to a nearby soccer field, where his brother Johann was waiting with gas cans. With the airplane refueled, the pair took off, bumbled



into heavy fog and died when they hit a low hill in the Vosges range, in eastern France. Whether they were to be paid by the French, who evidently had initiated the theft, or simply wanted to migrate westward has never been determined.

A far more notorious Me-110 heist was Rudolf Hess' jaunt to Scotland in May 1941, a mission he had carefully planned for almost a year. At the time, Hess was Hitler's deputy führer and a moderately experienced pilot. Hess had first asked Messerschmitt for a 109, saying he wanted to be combat-capable if needed, but Willy thought that was a bit much. Hess was able to requisition a 110 for his occasional personal use, and over time he quietly had it equipped with long-range tanks, oxygen gear and special radios. Hess imagined that he could fly to the British Isles, negotiate personally with the government and effect a negotiated peace that would spare all concerned a great deal



of trouble. He bailed out of his 110 near Glasgow and was promptly arrested, jailed and four years later sent to the Nuremberg trials, where he was sentenced to life imprisonment. So much for personal diplomacy.

Initially, all seemed to go well for the Me-110 when the war started. Over Poland and then Norway, 110s met little opposition and ranged freely in a ground-attack role. Both Junkers Ju-87 Stukas and *Zerstörers* were the Wehrmacht's flying artillery. And both Stukas and *Zerstörers* found their nemesis in the RAF.

During the Battle of Britain, the Me-110's main flaws as a fighter quickly became apparent. In British aviation historian Martin Windrow's words, "It was easily identifiable from long distances; its acceleration and speed were insufficient to allow it the luxury of avoiding combat; it was sluggish in evasive maneuvers; its turning circle was wide; and with its large wing and tail surfaces, it presented a good target....The destroyer became the destroyed."

The Luftwaffe began the Battle of Britain with 237 Me-110s. By the end of that fight, it had lost

HUNTERS & HUNTED

Left: Night fighter ace Heinz Vinke's Me-110 falls victim to Hawker Typhoons over Dunkirk in 1944. Top: Me-110G-2/R3 "formation destroyers" armed with extra belly cannons and underwing rockets roll in for an attack. Above: An Me-110G-2 crew from the ZG 1 "Wasp Wing" commemorates its 100th mission over the Russian Front.



SECRET REVEALED

When Wilhelm Johnen force-landed this Me-110G-4 at Zurich, Switzerland, in April 1944, the Allies finally learned about the night fighter's *Schräge Musik* gun installation.

223, though of course numerous replacement units had joined the several squadrons involved. (By the end of the war, 6,170 Me-110s had been manufactured.)

The 110's only real defensive maneuver was to form a broad circle and tail-chase each other until, they hoped, some 109s showed up. Each *Zerstörer* could in theory cover the one in front of it, though in reality Spitfires sniped at the 110s from outside the circle, since the Messerschmitts couldn't really maneuver and their rear gunners provided little protection.

For several good reasons, the Me-110 ultimately found its niche as a night fighter. Unlike most Luftwaffe aircraft, it was equipped for serious instrument flight, which could be a necessity even in clear weather, on moonless nights. Its enormous cockpit could accommodate a radarman and his electronics in a middle seat, with room left over for the Me-110's fiercest weapon, the upward-firing twin 20mm MG FF/M cannon called *Schräge Musik* (slanted music). The added weight was substantial, though: A fully equipped Me-110G night fighter weighed more than 10 tons—almost twice the weight of the original 1938 Bf-110B.

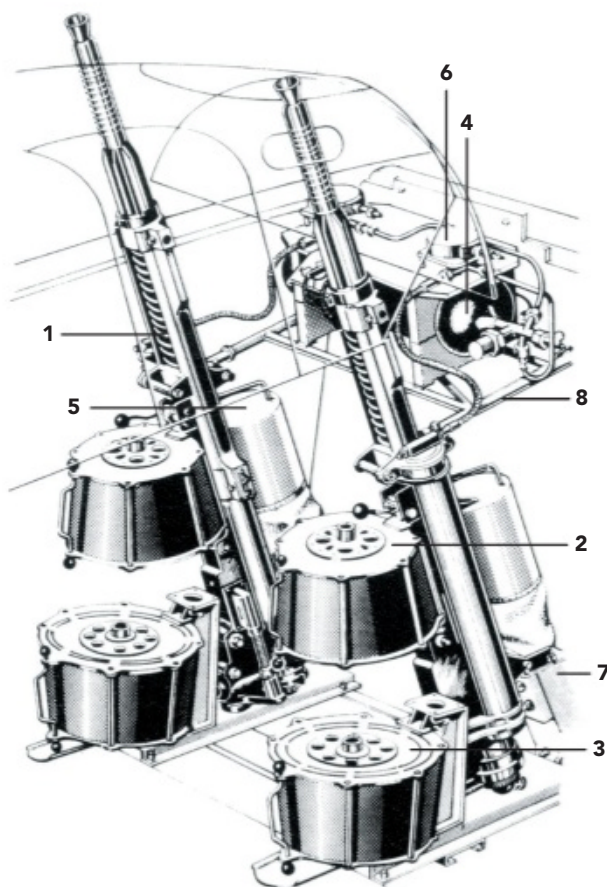
The Germans had done considerable work in the mid-1930s in developing effective cavity-magnetron radar, though the British are rightly credited with having improved the cavity magnetron to the point of being practical for internally mounted, streamlined airborne radar. The Germans used cavity magnetrons for their excellent Wurzburg fire-control radar to direct flak guns, but the airborne Telefunken sets in Me-110s and other night fighters all used draggy external stag's-antlers antennas.

The *Schräge Musik* guns were fixed, and the only aiming consisted of a 110 pilot ghosting under an RAF bomber from astern. Usually he maneuvered to point the cannons at the fuel tanks in the wings, as a clean centerline belly shot could set off an Avro Lancaster's bombload, which would be as fatal for an attacking Messerschmitt directly under that cataclysm as it would be for the bomber.

A two-second burst of twin 20mm fire typically was enough to finish a Lanc, and the Brits literally never knew what hit them. The *Schräge Musik* cannons often fired special high-explosive rounds with three times the blast of a normal 20mm HE round. It took nine months for the RAF to figure

TECH NOTES

SCHRÄGE MUSIK INSTALLATION



1. 20mm MG FF/M cannon
2. Ammunition drum
3. Reserve drum
4. Compressed air bottle with reduction unit
5. Cartridge casing holder
6. Cocking unit
7. Weapons mount
8. Weapons bracing truss

out where the *Schräge Musik* attacks were coming from, since no tail gunners survived who might have seen a 110 quietly sliding underneath their aircraft. It has been called one of the major intelligence debacles of the European air war because a captured Luftwaffe mechanic had revealed its existence early on during interrogation but was ignored. Examination of a damaged Me-110G-4 that force-landed in Switzerland in April 1944 finally revealed the slanted guns.

Schräge Musik was so effective that in February 1945 Me-110 pilot Heinz Wolfgang Schnauffer, history's highest-scoring night fighter ace, shot down seven Lancasters in a single night and then simply quit. "They seemed to be lining up to be shot down," he said. "I just had to stop after the seventh one. I was tired of the killing." It was effectively the 110's swan song, with the war in Europe ending less than three months later.

After the war, Royal Navy test pilot Eric "Winkle" Brown was one of the few Allied pilots to fly an Me-110. The Battle of Britain, he later wrote, "was to lead to a widespread belief that it

LANCASTERS
"SEEMED TO BE
LINING UP TO BE
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SEVENTH ONE.
I WAS TIRED OF
THE KILLING."

was an unsuccessful design. This was in fact far from the case.” Brown pointed out that the 110 was never intended to be used “other than in conditions of local Luftwaffe superiority if not supremacy.” The 110 could effectively use its enormous firepower against another aircraft “only if it could employ the element of surprise or if it encountered an unwary novice.”

A German Me-110 pilot commented: “The 110 was a safe, easy airplane to fly, but it was slow like molasses. And it could not stay in the air more than an hour and a half before we had to get back. What if we encountered Spitfires? In a 110? Get the hell out of there. Get away.”

No account of the Me-110 is complete without a mention of its intended successor, the Me-210. Unfortunately for the Luftwaffe, the 210 was one of the worst designs to ever be committed to combat by any air force.

The Luftwaffe had asked Willy Messerschmitt to come up with an upgraded 110, but as with the original Bf-110, Messerschmitt ignored the Ministry of Aviation’s specific request for proposal and designed an entirely new airplane. He and his engineers got the wing profile totally wrong, made several critical production errors that created a weak after-fuselage and empennage, and came up with a short-coupled planform that put the props well ahead of the nose of the airplane, which apparently contributed to its extreme longitudinal instability.

The Me-210 and the concurrent Heinkel He-177 were such disasters and the wartime pressures so great that in November 1941 Luftwaffe Director-General of Equipment Udet put a pistol to his head. He was succeeded by Messerschmitt’s archenemy Erhard Milch, who certainly did the 210 no favors. Udet had written a famous memo to Willy Messerschmitt that he might as well have titled, “Hey, pal, it’s not rocket science.” In his constant pursuit of lightness, Messerschmitt had so weakened the 210’s landing gear that Udet wrote: “One thing, dear Messerschmitt, must be made clear between us, there must be no more losses of machines in normal ground landings as a result of faulty undercarriage. [Landing gear] can hardly be described as a technical novelty in aircraft construction.”

It took nearly two years for Messerschmitt to accede to test pilot Hermann Wurster’s insistence that the 210 needed a longer fuselage for better stability and takeoff/landing handling. By then it was too late. The 210 loved to snap and spin in a traffic pattern while turning with gear and flaps down. When Me-110 pilot Johannes Kaufmann was sent to a training airfield in Germany to transition to the 210, he arrived overhead to find the base littered with “crashed airplanes scattered



**AT ONE POINT,
THE VICTORY-
TO-LOSS RATIO
WAS 30 RAF
BOMBERS
DOWNED
FOR EVERY
ME-110 LOST.**

around the airfield,” obviously new and recognizable as Me-210s.

In March 1942 Willy Messerschmitt was ordered to kill the Me-210 and return to building Me-110s. His company had lost the equivalent of \$1.85 billion in today’s dollars on the 210 program and had almost gone out of business. (Milch must have been delighted.) But Willy immediately began development of the Me-110G, the final mark of the airplane (an Me-110H was planned but never built). The Me-110G-4 was the definitive version and the ultimate 110 night fighter. It had 1,475-hp DB 605B engines, but the stag’s-antlers radar antenna made it barely 30 mph faster than a Lancaster—just enough speed to slowly overhaul a bomber but with little grunt to spare.

Most Me-110 night fighters were lost to mid-air collisions and German flak. Few were downed by RAF gunners. Eighty percent of Lancaster tail gunners didn’t even return fire when attacked, since they never saw their adversaries. (The night fighters didn’t use tracer rounds.) At one point, the victory-to-loss ratio was 30 RAF bombers downed for every Me-110 lost.

The Me-110G-2 that Winkle Brown flew is today one of the only two intact and original 110s in existence. It is on display at the RAF Museum at Hendon, in North London. The other example, an Me-110F-2, is in Berlin’s German Museum of Technology. A third, displayed as an Me-110G-4, is owned by a Danish group in Gilleleje, about 40 miles north of Copenhagen. It is actually a restored assemblage of parts from a variety of 110s.

The Me-110, a workmanlike killing machine, was not particularly attractive, glamorous or technologically advanced. By the end of the war, it was an archaic mid-1930s design—along with the Heinkel He-111, Junkers Ju-88 and Boeing B-17, one of the oldest multiengine airplanes still in combat. And as is so often the case, one of the more consequential World War II combat aircraft has barely survived. ✚

Contributing editor Stephan Wilkinson suggests for further reading: Willy Messerschmitt: Pioneer of Aviation Design, by Hans J. Ebert, Johann B. Kaiser and Klaus Peters; Messerschmitt Bf 110 at War, by Armand Van Ishoven; Bf 110 vs Lancaster: 1942–1945, by Robert Forczyk; and Duel Under the Stars, by Wilhelm Johnen.

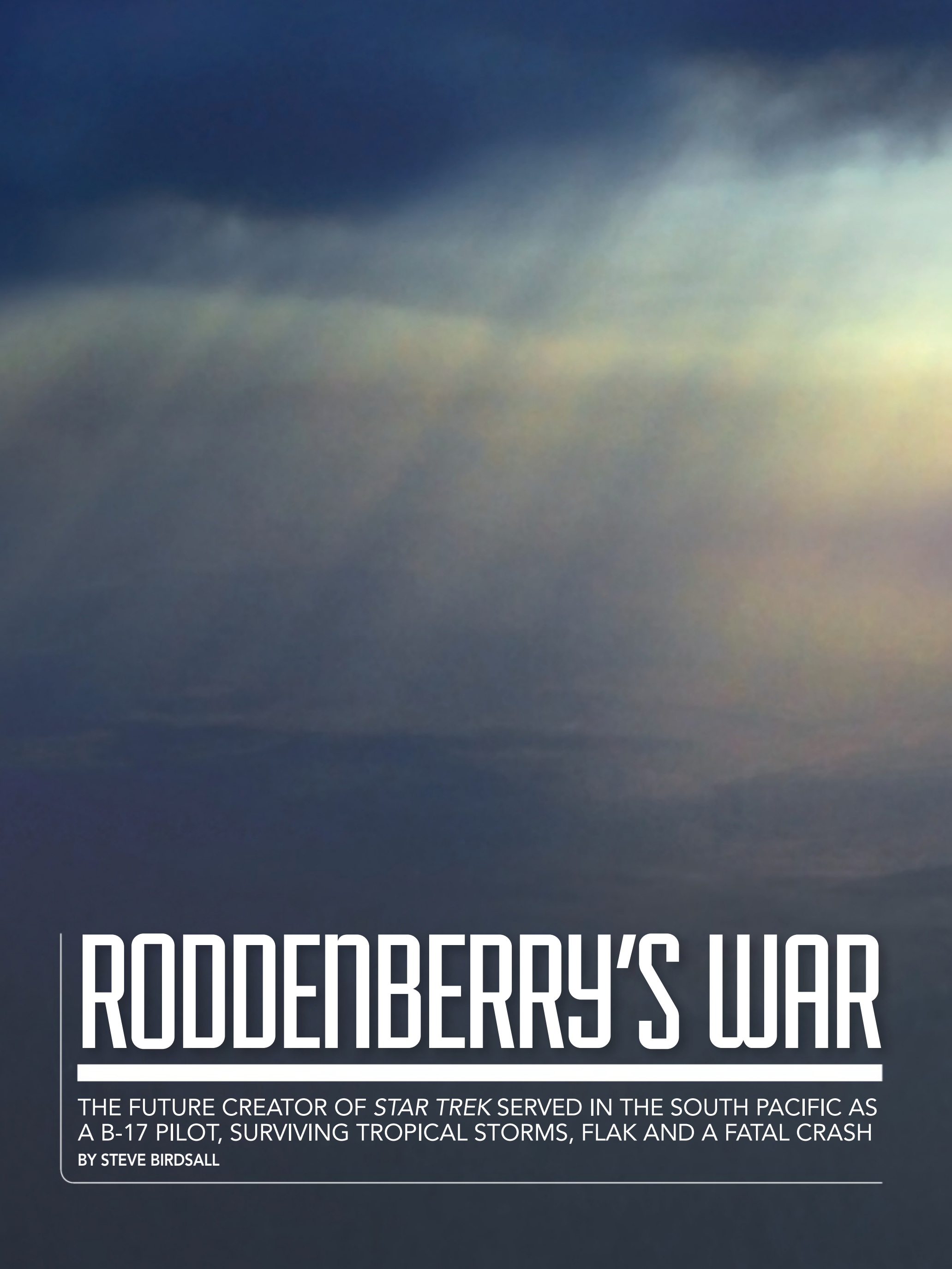
FAILED SUCCESSOR

Built to replace the Me-110, the Me-210 had, in the words of Messerschmitt’s chief test pilot, “all the least desirable attributes an airplane could possess.”



BOLDLY GOING...

Los Lobos, a Boeing B-17E of the 394th Bombardment Squadron, penetrates a tropical front over the Solomon Islands, in a Jack Fellows illustration. Among its crew was 2nd Lt. Eugene Wesley Roddenberry.



RODDENBERRY'S WAR

THE FUTURE CREATOR OF *STAR TREK* SERVED IN THE SOUTH PACIFIC AS A B-17 PILOT, SURVIVING TROPICAL STORMS, FLAK AND A FATAL CRASH
BY STEVE BIRDSALL



**SECOND LIEUTENANT EUGENE WESLEY
RODDENBERRY WAS JUST 21 YEARS OLD WHEN
HE REPORTED FOR DUTY IN SEPTEMBER 1942 AS
A COPILOT WITH THE 394TH BOMBARDMENT
SQUADRON AT BELLOWS FIELD ON OAHU.**

BATTLE-TESTED COMMANDER

Opposite: Major Orin H. Rigley, 394th commander and a Midway veteran, stands second from right with his crew in front of the B-17E *Crock O' Crap*.

Since the Japanese attack on Pearl Harbor, the 394th had been patrolling the ocean around Hawaii and training crews. Now it was preparing to go into action in the South Pacific under its new commander, West Pointer and Midway veteran Major Orin H. Rigley.

Gene Roddenberry was assigned to the crew of Lieutenant William Ripley. Beefy, ruddy Bill Ripley was a preacher's son from Des Moines, Iowa. Other members of the crew included navigator Lieutenant Joe Jacobs, bombardier Tech. Sgt. James Kyle and flight engineer Staff Sgt. Harry Scotidas.

The 394th was ready; now all the aircrews needed was their new airplanes.

The question was, where would those new planes come from? The decision had already been made that no new B-17s would be sent to the Pacific, so it seemed likely the 394th would become a B-24 outfit.

The answer arrived in early November 1942 in the form of a dozen war-weary 19th Bomb Group B-17Es, homeward bound from Australia. After inspection, seven of the old bombers were held over for reassignment to the 394th.

By the time they were delivered to Bellows Field, the Flying Fortresses had been thoroughly overhauled and fitted with twin .50-caliber nose guns and other modifications. A few still displayed the Indian head insignia of the 93rd Bomb Squadron, and a couple had nicknames: serial no. 41-2440, the oldest of them all, was *Calamity Jane*; 41-2632 was *Crock O' Crap*.

The 394th pondered a new question: "Would we ever get down there in those old things?"

The seven southbound B-17s took off from Bellows on November 15, led by Major Rigley in *Crock O' Crap*, flanked by Captain Morris Slack in *Calamity Jane* and Lieutenants Ripley and Roddenberry in 41-2644.

In a sign of things to come, Rigley was forced to return to Hawaii with mechanical problems and Captain William Ivey in 41-2642 turned back with a dead engine and a dangerously windmilling propeller. The other five landed safely at Kiritimati Island, then continued on to Canton and Fiji, landing at Nadi (also spelled Nandi) on Viti Levu in the afternoon of November 18. Rigley arrived the following day, and Ivey caught up two days after that.



The squadron was tasked with patrolling the seas around Fiji to protect the vital southern route to Australia. Like all the squadrons of the 5th Bomb Group, they would also be required to fly strike missions from Guadalcanal.

The men of the 394th began a daily routine of conducting two and sometimes three frontal sea searches—700 miles out, 100 miles across, 700 miles back—and were settling comfortably into their new home when a body blow came in the form of two Douglas SBD Dauntlesses from Scouting Squadron 6. A night familiarization exercise went badly astray when the U.S. Navy pilots apparently became confused about exactly where the runway lights were and crashed into two B-17s parked beside the airstrip.

The 394th's intelligence officer, Captain Myron Scott, reported that the first SBD "sliced off the nose" of *Calamity Jane* "as though it were baloney" and the other slammed into the middle of Captain McLyle Zumwalt's 41-2658, "bending it like a hairpin." Nobody was seriously injured but it was a heartbreaking start to the deployment. *Calamity Jane* would fly again, but Zumwalt's bomber was a write-off—although also a handy source of parts.

APTLY NAMED

Top: A wayward Douglas SBD made short work of *Calamity Jane*'s nose while attempting a night takeoff at Nadi on Viti Levu. Above: Gene Roddenberry stands second from left in front of *Los Lobos*. Talbert "Shorty" Wollam, at far right, was later killed when *Yankee Doodle* crashed at Espiritu Santo. Inset: The emblem of the 394th Bomb Squadron.



SO FAR, SO GOOD

Above, from left: Captain Bill Ivey, 2nd Lt. Sanford Price, Captain Edward Quintard, 1st Lt. Robert Crandall and Roddenberry pose outside the officers' club at Nadi. Right: Lieutenant Bill Ripley proudly points to his crew's combat record.



The order they had been waiting for came through around 9 p.m. on January 2, 1943, when all available planes and crews were ordered to fly to Henderson Field on Guadalcanal by way of Espiritu Santo in the New Hebrides.

The five B-17s carrying seven crews took off at 8 the next morning and landed at Espiritu Santo in the middle of the afternoon. Along the way Ripley, Ivey and Captain John Turner in 41-2668 all experienced mechanical problems, leaving only Rigley's *Crock O' Crap* and Captain Elmer Schoggen's 41-2630 to complete the flight to Guadalcanal the next day. Slack and Zumwalt managed to join them by borrowing two old planes from the 11th Bomb Group, but the exasperated Ripley, Ivey and Turner crews—including Roddenberry—were left behind.

Finally, after 10 days of frustration, Ripley's bomber was repaired and they took off on the

roughly four-hour flight to Henderson Field. Perhaps unsurprisingly, an engine conked out along the way but the B-17 completed the journey in one piece.

The next day they joined a nine-plane strike force to search for a damaged Japanese destroyer reported off the coast of New Georgia. When the Americans found the destroyer, it appeared to be far from crippled and the B-17s failed to claim even near misses.

On January 16 Rigley led four 394th planes on a night strike against Kahili, the Japanese fighter strip on the southeastern tip of Bougainville. They bombed individually through sporadic anti-aircraft fire and, for what the crews believed was the first time on a night mission, they were attacked by A6M Zeros. The Japanese fighters attacked in formation and began firing from far enough away to give the B-17s time to turn toward them. Jim Kyle in the nose of 644 opened fire with his twin .50s and saw his target "fall in three burning pieces."

On January 19 the 394th flew back to Espiritu Santo to spend the night. Spirits were high in Ripley's B-17. Roddenberry took center stage with a stirring rendition of "The Cremation of Sam McGee," but everyone joined in the fun and Ripley was content to let them unwind. The 394th was in the war again, and this time they were the ones dropping the bombs.

The days passed and the 394th fell back into the Fiji routine. New crews arrived, with more old planes, and lightened the workload. The men built and enthusiastically christened an officers' club, and there was the prospect of 10 days' leave in New Zealand for the combat crews. Roddenberry spent a lot of his spare time reading and occasionally writing verse, successfully revamping a World War I trench song as the squadron theme song (see sidebar, opposite).

He fit in well enough, although some of his more esoteric literary references seemed condescending to the more down-to-earth officers in the 394th.

One sea search was usually much like another, but the unpredictability of the South Pacific weather was always a factor. Pre-mission forecasts, based on observations from the previous day, could be unreliable. Thus there had been no hint of what was to come when two B-17s piloted by Captains John Britton and Bill Ripley took off at about 0500 hours on a routine daily search.

Just after noon a garbled coded message from Britton's plane indicated he had encountered extreme weather and was diverting to Espiritu Santo. There was no word from the other B-17, but nobody was unduly concerned.

Ripley was expected back around 1630, and when another hour had passed those waiting on the ground grew more anxious, straining to hear



I WANNA GO HOME

Theme Song of the 394th Bomb Squadron

I wanna go home
I wanna go home
Ack-ack and Zeros are driving me mad
You can't eat the chow and the liquor is bad
Take me back to 'Frisco
That's where we're longing to go
Oh Ma, I'm too young to die
I wanna go home

I wanna go home
I wanna go home
Our B-17s are breaking to bits
They won't hold together for many more trips
Let's go back and sell Bonds
And cheer the war heroes on
Oh Ma, I'm too young to die
I wanna go home

I wanna go home
I wanna go home
We're through with the Shortlands and old
Bougainville
If the Japs don't get you, the weather sure will
Even Texas is better than this
A land of comparative bliss
Oh Ma, I'm too young to die
I wanna go home

I wanna go home
I wanna go home
The Flight Surgeon tells me I'm ready to fly
The Chaplain tells me I'm ready to die
But we'll take none of that stuff
We know when we've had enough
Oh Ma, I'm too young to die
I wanna go home

I wanna go home
I wanna go home
"Time" tells us that ack-ack's a beautiful sight
"Life" printed a picture of tracers at night
But the stuff that we see is real
From up close it loses appeal
Oh Ma, I'm too young to die
I wanna go home

The altimeter had dropped to zero when Kyle had the terrifying experience of looking past Roddenberry to see a wall of water, and spray whipping the cockpit windows. Then as if by a miracle the B-17 straightened out and they were through the front.

"There was a cushion of air right on top of the water that saved us," Ripley concluded. "I'll go over a strong Jap air base any day but never through a tropical front like that again." Roddenberry was just "surprised to get out of the storm alive."

The three left to make their way uphill to the officers' club. On foot.

the sound of approaching engines and watching the sky. There was widespread relief when Ripley's B-17 finally landed at 1745. A jeep was dispatched to bring the officers back to operations, but the nonplussed driver returned to explain that Ripley, Roddenberry and Jacobs had refused the ride and were walking back because, they said, they wanted "to feel the earth beneath their feet."

At the operations office they told a harrowing story. About 600 miles into the outward leg of their search they had encountered what Ripley called a "dull gray wall" rising from the ocean and stretching as far as they could see.

"I had never seen a tropical front like that one," said Ripley. He supposed he should have turned back, but because the front was dull gray, not black, and the weather forecast had predicted moderate conditions, he pushed on, trying unsuccessfully to find a hole in the forbidding gloom.

"So we plunged into it," he continued. "For the first half hour there was the turbulence to be expected, with the plane yawing and rising and falling in bumps. The rain was coming down in solid sheets and the engines began to sputter. Then a strong updraft caught us and took us from 500 feet up to 7,000 feet altitude, although both Rod and I were pushing the sticks full forward. Then just as suddenly we went downward while we both reversed the sticks, holding them back against our stomachs as far as they would go."

In the nose navigator Joe Jacobs was on the roof of his cabin, "sitting on nothing and trying to reach the floor with my feet." Bombardier James Kyle had been out of the nose and was now unable to get back there, so he wedged himself between the pilots' seats. Engineer Harry Scotidas was "dodging the ammunition boxes and ammunition belts, and D-rations and junk" that "came flying through the air from one end of the plane to the other."

**"I'LL GO OVER
A STRONG JAP
AIR BASE ANY
DAY BUT NEVER
THROUGH A
TROPICAL
FRONT LIKE
THAT AGAIN."**

AIRMEN AT EASE
Roddenberry (center) and fellow copilots raise a glass in the Nadi officers' club.



ROLL CALL

Top: B-17E 41-2467 *San Antonio Rose* was assigned to 394th Captain John Hunter Pitts. Above: Roddenberry flew most of his 89 missions as *Los Lobos'* copilot.

As time passed the crews grew fonder of their old warplanes, if not their Wright engines, and between searches found time to paint names on them. Schoggen's 630 was *Oklahoma Sooner*; Ivey's 642 naturally became *Poison Ivey* and Turner's 668 was *Chosef*, with a painting of the boxing kangaroo from the Snuffy Smith comic strip on the nose. Ripley's 644 was named *Los Lobos*.

In mid-April of 1943 Major Rigley was promoted and transferred to 5th Group headquarters, and McLyle Zumwalt took over the 394th Bomb Squadron.

On April 25 the air echelon was ordered to proceed to Guadalcanal for another few weeks of strike missions. Guadalcanal had been declared secure since February, although Japanese aircraft continued to carry out small but sometimes deadly night raids.

A series of bombing missions that began on April 28 was continually hampered by weather.

The B-17s attempted a Bougainville strike on May 3, but were beaten back by a massive weather front. Ripley and Roddenberry tried to climb over it, but had to give up when the altimeter neared 20,000 feet.

The weather was still bad on May 11 when five B-17s managed to break through to hit various Bougainville targets. Zumwalt reported that most of the planes were over the target for more than an hour, bombing through the broken cloud. He noted that Ripley was "over the Bougainville area for over an hour and forty five minutes before he found suitable targets for all his bombs" and returned with "the tanks almost dry." He concluded that "it was generally agreed that the Japanese received absolutely no sleep on that night."

Zumwalt led a nine-plane strike force to Kahili and Ballale on the night of May 13. This time each B-17 was carrying six 800,000-candlepower M-26 flares in addition to the bombload. The carefully timed plan was for each B-17 to bomb by the light of the flares dropped by the previous plane, in turn releasing its own flares to light the way for the following B-17. The searchlights and anti-aircraft fire were intense, and Japanese fighters were seen but did not engage.

The run of bad weather continued as missions were repeatedly planned and then cancelled.

The Navy was determined to blockade southern Bougainville by mining Shortland Harbor, but it was a dangerous mission against a well-defended target, so they called on the Army Air Forces to provide a diversion. On May 20 four 394th B-17s answered the call. Ripley and two others were carrying a load of fragmentation bombs; the fourth Fortress was loaded with 14 300-pounders. The B-17s concentrated on the searchlight and anti-aircraft positions while Navy TBF Avengers slipped in at 1,500 feet and completed their task without loss. The mission was successfully repeated three nights later with eight B-17s distracting the enemy defenses.

The 394th was relieved on June 5 and returned to Fiji, where Roddenberry learned that he was one of five copilots who had qualified as a B-17 first pilot. A week later the squadron was informed that it was leaving Fiji for good, and the last search patrols from Nadi were flown on June 16.

A third series of strike missions from Carney Field, a new airstrip on Guadalcanal about 20 miles east of Henderson, began with a successful attack on Bairoko Harbor on New Georgia on July 4.

Roddenberry flew his first recorded strike mission as an aircraft commander in old *Crock O' Crap* on July 8. The target was again Kahili, and Major Zumwalt led the nine B-17s in 41-9217, *The Globe Trotter*. The Fortresses were only about 60 miles short of the target when they encountered an enormous weather front that began about 500 feet above the ocean and stretched all the way up to

25,000 feet. They had no choice but to turn back.

On July 11 Roddenberry was in *Yankee Doodle* with a load of frag bombs for the revetments at Kahili. The squadron's B-17s made their way to the target individually and the weather was good, but the glare of about a dozen searchlights and intense anti-aircraft fire prevented them seeing the results of their bombing.

Two days later Roddenberry was flying *The Globe Trotter* on what would be the final mission of the series, another attack on Kahili's dispersal and supply areas, this time loaded with 500-pound bombs. Lieutenant Colonel Rigley from group HQ led the nine-plane mission in *Crock O' Crap* and was first over the target at 2203, followed by Captain John Pitts in *San Antonio Rose*.

Roddenberry followed Turner's *Chosef* and his eight bombs tumbled onto an anti-aircraft position and continued across the northern tip of the runway. The searchlights were concentrated but the anti-aircraft fire was so light that the B-17 crews suspected there must be Japanese night fighters in the area. If there were, they did not engage.

The mission was considered a complete success, and it was time for the 394th to leave Guadalcanal and return to Espiritu Santo.

It was about 0600 on August 2 when Myron Scott heard "that sickening thud that we had learned to know so well and to dread, followed by the popping and cracking sound of exploding ammunition." Scott was sharing a tent with pilots Bill Ivey and Elmer Schoggen, and all three quickly dressed, jumped in a jeep and headed for the smoke rising from the end of the Espiritu Santo runway. Their hearts sank as they drove closer and saw the big tail with the yellow numbers 12463 painted on it.

For Roddenberry and his crew in old *Yankee Doodle*, the fatal flight had begun as a routine sea search. Approaching the halfway point on his take-off run it was obvious something was wrong. He would not have enough speed to get airborne and had no choice but to abort. Roddenberry chopped the throttles and stood on the brakes, but it wasn't enough and his only other option was to ground loop the plane. He ordered copilot Lieutenant Frank Belosic to unlock the tail wheel, but when Belosic grabbed the lever beside him it would not disengage. There was no time left and they braced for the crash as the aircraft left the runway.

Yankee Doodle roared off the end of the strip and plunged into the dense jungle beyond. Thick vines hid a maze of tree stumps that smashed in the nose of the B-17, crushing the bombardier, Tech. Sgt. John Krueger, and navigator Lieutenant Talbert Wollam and tearing the plane apart. Everybody else got out, shaken but not seriously hurt, and *Yankee Doodle* began to burn.

Roddenberry took it hard, leaving his tent only



TRAGIC END

Very little remained of *Yankee Doodle* after its deadly crash and fire on August 2, 1943.

to attend the funerals of Wollam and Krueger. "Shorty" Wollam in particular was well-liked, and his loss seemed especially cruel. He had left Hawaii in November 1942 as the 394th's armament officer but had earned his navigator's wings when the squadron, short of navigators, set up their own school, dubbed the Royal Fijian Institute of Navigation.

The tragedy cast a pall over the whole squadron, particularly the "originals" who had come to Fiji in the seven hand-me-down B-17s the previous November. Some squadron members blamed Roddenberry for not reacting quickly enough, or making the wrong decisions, but the official report concluded he was not at fault.

Morale in the 394th Squadron sank to an all-time low. Scott described it as "the old refrain, their luck had run out, they didn't have any chances left. They blamed their equipment, the old battered and patched Fortresses they had used from the beginning. Then the high command did a merciful thing. The entire flying personnel were taken off active duty, the newcomers being transferred to other squadrons. They went even further and dated the orders for relief a couple of days before the Roddenberry crack-up, so that on the record, at least, they had done their part in the war without a single loss, combat or operational, to plane or personnel."

Within days the 394th veterans were loaded aboard a Dutch freighter, and three weeks later they sailed under the Golden Gate Bridge in the small hours of August 27. The next day they were taken to Angel Island, where Roddenberry received a Distinguished Flying Cross. He did not serve overseas again and was honorably discharged from the Army Air Forces as a captain in 1945. ✈

Australia-based aviation historian Steve Birdsall recommends for further reading: Star Trek Creator, by David Alexander, and South Pacific Diary, by Mack Morriss.

**THERE WAS NO
TIME LEFT AND
THEY BRACED
FOR THE
CRASH AS THE
AIRCRAFT LEFT
THE RUNWAY.**

AIR RAID RE-CREATION

Supermarine Spitfires scramble to get into the sky as Duxford airfield comes under attack during the Battle of Britain—not the 1940 campaign, but the 1969 movie.



MAKING BATTLE OF BRITAIN

FIFTY YEARS AGO, FILMING THE CLASSIC AIR EPIC REQUIRED FORMER ADVERSARIES TO RELIVE THE WAR, AND REOPEN OLD WOUNDS

BY DON HOLLWAY

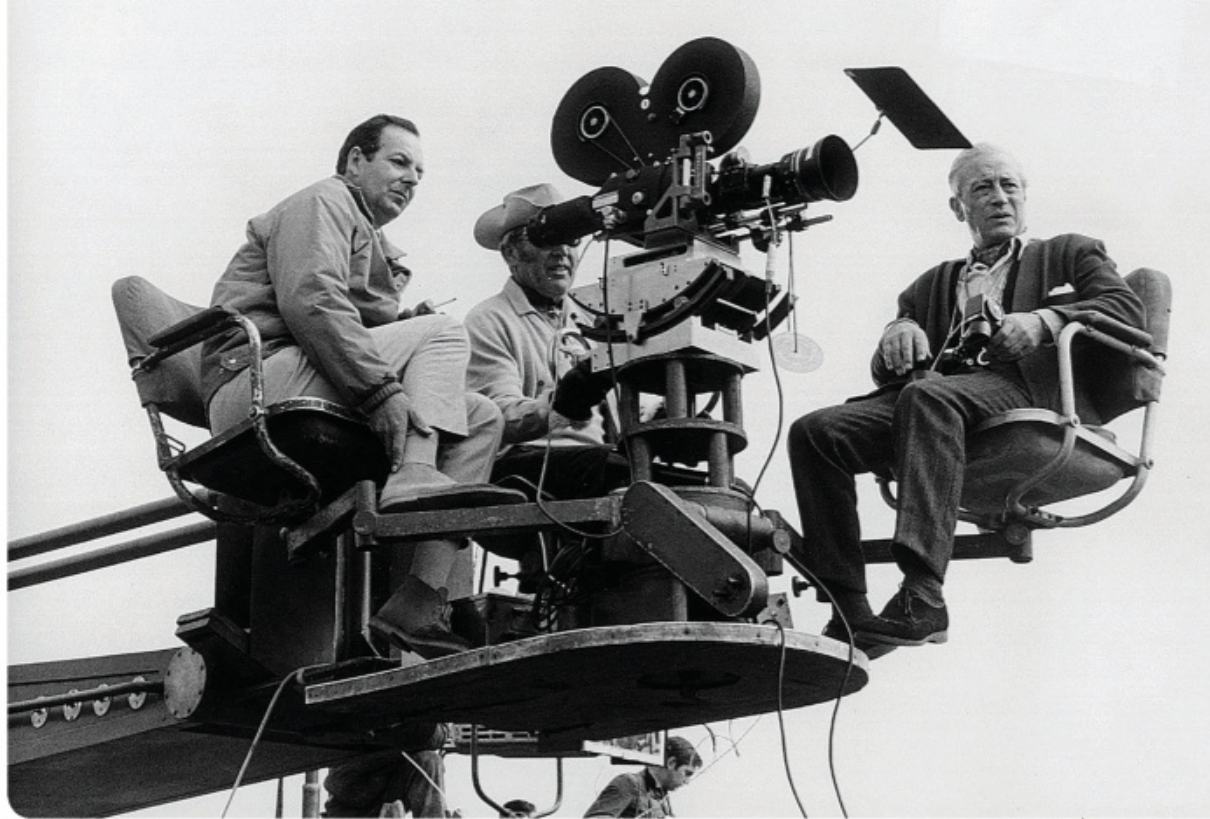


SPANISH "LUFTWAFFE"

Two Messerschmitt Me-109s (actually Hispano Aviación HA-1112 *Buchóns*) come to the rescue of three embattled Heinkel He-111s (played by CASA 2.111s) in a scene from the movie shot on September 15, 1969—appropriately, Battle of Britain Day.



AS USUAL, THE ODDS WERE AGAINST THE ROYAL AIR FORCE. THIS TIME IT WAS JUST ONE HEINKEL BOMBER, BUT WITH AN ESCORT OF 17 MESSERSCHMITTS, CROSSING THE WHITE CLIFFS OF DOVER BEFORE WHEELING NORTH TOWARD THE RAF BASE AT DUXFORD.



Squadron Leader Ron Chadwick acquired them on ground-control radar, but could only send two fighters to intercept them. “We are expecting our foreign visitors in 10 minutes, Spitfire red leader,” he radioed. “Keep your eye open for them.”

“Spitfire red leader here. I have sighted our visitors.” The Spit pilot called his wingman, flying a Hawker Hurricane: “Remember, they don’t know we’re here. Let’s go in and surprise them.”

Outnumbered almost 10-to-1, the two Brits swept down on the black-crossed intruders... and pulled up in front of them, wagging wings in greeting. The “Luftwaffe” leader’s response on landing at Duxford has gone unrecorded, but it was in Spanish, not German. This wasn’t 1940; it was May 1968, and the Spits and ’Schmitts were to spend the summer filming the greatest World War II air combat epic of all: *Battle of Britain*.

Producer Ben Fisz had flown Hurricanes for the RAF and Polish air force in the war. He pitched his concept as a British *The Longest Day*—the 1962 20th Century Fox D-Day movie—but in the air. “This will be the biggest picture ever made in Great Britain, and possibly the biggest in the world,” enthused Fisz.

But the idea of a big-budget air war epic with

no Yanks in it almost never got off the ground. American studio bosses thought the initial script “awfully English” until James Bond producer Harry Saltzman brought director Guy Hamilton (*Goldfinger*) aboard. “What we want to do is show what it really was like,” Hamilton said. “How it was to be involved in aerial combat. The kind of timing and sheer animal ability it took.”

United Artists and virtually every big-name British actor of the day—among others, Sir Laurence Olivier, Michael Caine, Trevor Howard, Christopher Plummer and Robert Shaw—got on board (though not Sean Connery, then distancing himself from Saltzman and the Bond franchise).

BEHIND THE CAMERA

Clockwise from top: Director Guy Hamilton (left) shoots a scene; Michael Caine and Bianca de Marquis (Mick Jagger’s future wife) relax between takes; Robert Shaw, dressed for his part, stands near a Spitfire.



ACTORS & ACES

Top: British actors Susannah York and Kenneth More (both in uniform) share a Spitfire with aces (from left) James "Ginger" Lacey, Peter Townsend and Robert Stanford Tuck. Above: Pilots are briefed near the B-25 "Psychedelic Monster."

Securing the film's other "stars" fell to former RAF Group Captain Thomas "Hamish" Mahaddie, veteran of Bomber Command's Pathfinder Force and a film industry warbird wrangler. "Within 10 days I had found out that there were over 100 Spitfires still left in the world," he said. "They were not all airworthy, but they had possibilities."

Most were late-war models, with four-blade props, wing cannons, teardrop canopies, pointed rudders and clipped wingtips. They were altered to Battle of Britain-era Mk. I standards except for their Merlin and Griffon engines (note six exhausts

per side instead of the correct three). Stunt doubles were built from the ground up, several with motorcycle engines enabling them to taxi before being blown up.

Hurricanes, which outnumbered Spitfires during the battle, had not fared so well after the war. The Ministry of Defence could supply just three, only one of which could fly. Manufacturer Hawker Siddeley provided another, and one was flown in from Canada, disassembled, aboard an RAF C-130. The sixth, a rare Sea Hurricane Ib, could taxi but tended to overheat in the air.

Finding German warbirds was even harder. No Junkers Ju-87s were available at all; the Stukas in the movie are all radio-controlled flying scale models. Former Luftwaffe Lt. Gen. Adolf Galland, a battle veteran who had joined the film company as technical adviser, told Mahaddie: "Why don't you try Spain? Their bomber force is composed of Heinkel bombers, though they use Rolls-Royce Merlin engines in them nowadays instead of Mercedes-Benz. Their fighter force used to use Messerschmitts, too—with Merlin engines also—but I hear they're scrapping them. They might let you buy them."

Flying to Tablada Airfield on the outskirts of Seville, Mahaddie found eight Hispano Aviación HA-1112 M1L *Buchóns* (essentially license-built, Merlin-powered Me-109Gs) being sold off by the Spanish air force, along with sufficient parts to build some 20 more. He bought the lot for \$2,250 each. Representatives of the Confederate Air Force



(today's Commemorative Air Force) from Texas had purchased four *Buchóns* and agreed to loan them and the CAF's Spitfires to the filmmakers on the condition they could fly them in the air combat scenes and play bit parts as Luftwaffe officers. Given aileron struts, squared wingtips and dummy guns fitted to the wings and engine cowls (but retaining the Merlin engines, hence their almost P-40ish nose scoops), the *Buchóns* were as close to battle-era Me-109E models as they could ever be.

Acquiring the Heinkels, however, was not a matter of money. Madrid's CASA 2.111s—Merlin-powered Heinkel He-111s—were not for sale. Since the Spanish government was squabbling with Britain over Gibraltar, prospects of a bomber fleet for the movie were slim until Rolls-Royce threatened to withhold parts. Then Madrid agreed to lend the entire flotilla, with crews, free of charge, except for painting Luftwaffe camouflage and insignia and repainting in Spanish colors afterward.

Seville's airfields stood in as Luftwaffe air bases when filming began in March 1968. As the Spanish countryside looked nothing like Kent, the bomber scenes were filmed out over the Atlantic. For a counterattacker, Fleet Air Arm veteran, aircraft restorer and replica builder Vivian Bellamy flew a Spitfire IX fitted with a long-range external tank via Bordeaux to Madrid. "I decided to show them what a Spitfire could do," he recalled, "so when I took off I gave the aircraft 108 lbs of boost, and it literally shot into the sky, followed by a low flypast down the runway. As I was about to turn on course for Seville, the airfield control tower came on the radio and said 'Would you do that again please.'"

A war surplus B-25, known as the "Psychedelic Monster" for its garish high-visibility paint scheme, served as camera plane. Aerial photographer John Jordan, who had lost a leg to a helicopter blade filming 1967's *You Only Live Twice*, invented a "parashoot" to hang underneath a helicopter while aircraft whirled around him. (In 1970 he would die in a fall from a B-25 while filming *Catch-22*.) Future airshow commentator John Blake of the Royal Aero Club served as dogfight choreographer. "We used to fly a racetrack pattern with the Heinkels," he recalled, "and the Messerschmitts were in the standard wartime finger four formation, but considerably closed up so that they would fit into the camera frame. We also used to get the filming sequences all lined up ready, and then a fleet



HONORED GUESTS

Clockwise from above left: Battle veterans Douglas Bader (left) and Townsend (right) talk with stars Shaw and Christopher Plummer; former RAF air chief marshal Lord Hugh Dowding (in wheelchair) visits with his former pilots during filming; Adolf Galland (center) on location in Spain.



of Spanish fishing trawlers would come into shot below us and we would have to go around again."

And that was when they were able to fly at all. The rain in Spain, it seemed, fell mainly on the planes. One aerial shoot per day was par; two was lucky. Filming fell behind schedule. Costs began to mount, and tensions rose.

The Spanish insisted their Heinkels join a ceremonial NATO flypast, which meant, on top of time lost, stripping and then replacing their Luftwaffe markings at an estimated cost of £1,000 per aircraft. Director Hamilton put up such a fuss that it was agreed to leave the bombers in Nazi warpaint, which surely garnered double-takes from ex-Allied brass at the event. And with only a limited number of concrete dummy bombs made, their bomb-run scene had to be done in one take. According to Blake, "On the allotted bomb-dropping day we flew south, instead of flying our usual westerly direction. The Heinkels set off and actually headed in the direction of Gibraltar. At that time General [Francisco] Franco was having one of his tantrums about the British and Gibraltar, and I did actually wonder whether the Spanish pilots were going to drop the concrete bombs on Gibraltar! Thankfully they didn't and the scenes were shot successfully."

Galland had flown with the Luftwaffe Condor Legion during the Spanish Civil War, but rejected the whole premise of a Battle of Britain. "We made a number of attacks against England between July and September," he said. "Then we discovered that we were not achieving the desired effect, and so

THE RAIN IN SPAIN, IT SEEMED, FELL MAINLY ON THE PLANES. ONE AERIAL SHOOT PER DAY WAS PAR.

THE HANGAR THAT GETS BLOWN UP IN THE ATTACK ON DUXFORD REALLY WAS A HANGAR AT DUXFORD, AND REALLY WAS BLOWN UP.

STAND-INS FOR OLD ENEMIES

Neither the HA-1112 (foreground) nor the Spitfire Mk. IX fought in the real Battle of Britain, but both were powered by Rolls-Royce Merlin engines.

we retired.” But Hamilton, who had lived through the Blitz, served in the Royal Navy and survived the infamous decimation of Convoy PQ-17 by Luftwaffe bombers and U-boats, openly detested Germans. He ultimately threw Galland off the set.

English battle veterans had been named technical advisers too: Group Captains Douglas Bader and Peter Townsend, Wing Cmdr. Robert Stanford Tuck and Squadron Leaders James “Ginger” Lacey and Bill Foxley, who had suffered terrible burns in a 1944 Vickers Wellington crash. Although from quite different generations, the actors gained new respect for the WWII pilots. “I can remember listening in Canada, night after night, to Edward R. Murrow on the radio describing the progress of the battle,” Christopher Plummer said. “Now to meet these guys like Bader and Lacey and Townsend is really something.”

The pilots were less impressed by the film stars. Shaw, taxiing a Spitfire, trod a little too hard on the brakes and stood it on its nose. And Lacey complained: “I’m having the devil’s time getting the actors to be authentic. I can’t get them to cut their hair. In those days, we were all close cropped, and these chaps look like bloody Beatles. They all say they dasn’t cut their hair; they’ll ruin their image.”

The pilots had cemented their image in the summer of 1940 and didn’t concern themselves now. Lacey even brushed off being awarded the Distinguished Flying Medal with Bar by no less than King George VI: “The king asked me what I’d got the medal for. I said I’d forgotten. Well then, he said, what about the bar? Well, I’d forgotten that too. He must have thought I’d come to pick up the medal for a pal of mine.”

Nor did they have much good to say about their old enemies turned Cold War allies. “It was quite a shock visiting Duxford air base today,” Bader told reporters. “That was my base during the war. I went out there today and saw all those Kraut airplanes, and I thought, what’s going on?”

“Well,” Lacey told him, “if it hadn’t been for the Battle of Britain they might really have been there.”

For the London bombing scene the studio bought an abandoned tea warehouse and demolished it, along with a derelict section of the city waterfront that had actually been heavily bombed in 1940 and, a generation later, condemned by the authorities. The hangar that gets blown up in the attack on Duxford really was a hangar at Duxford, and really was blown up, though it took two tries.

Unfortunately the bad weather followed the production to England, with similar effect on the flying schedule. “I was contracted for six weeks,” said CAF founder Wilson “Connie” Edwards, “and 11 months later I was still getting shot down—128 times, and that doesn’t count the practice runs. I could tell right quick I wasn’t gonna win the war.” (Edwards didn’t complain too loudly. In lieu of payment, he received 16 of the *Buchóns*, including a rare two-seat trainer. He traded two of them back for a Spitfire Mk. IX, and kept the rest at his ranch in Big Spring, Texas, until selling the last of them off in 2014. See “Restored,” P. 14.)

Grounded by rain and forbidden to hit the pubs, the battle veterans loitered around the airfields and nursed old wounds. “I loathe those crooked swastikas,” Bader told reporters. “...When you saw one of them go up in smoke one was delighted and one never thought about anyone being inside them.” Asked for the moral of the movie story, he said, “Surely the lesson is that one forgives but that one doesn’t forget. It’s as simple as that.”

Bader had lost both legs in an aircraft crash, but famously hadn’t let that stop him from flying fighters. He demonstrated for reporters how a double amputee gets in and out of a Spitfire and then, on request, did the same in a Spanish Messerschmitt, but came away wiping his hands. “You know, even if I was blind, I’d know I’d been in a bloody Kraut





kite," he said. "You can tell by their smell!"

That *Buchón* had likely never seen Germany. Robert Shaw said aghast, "I never knew people talked like that."

Galland, despite losing two younger brothers—also fighter aces—in the war, had personally seen to Bader's good treatment after his capture, but received little thanks for it and now harbored something of a grudge. Yet as filming wound down Galland and Stanford Tuck took the tandem-seat 109 up for a flight together, and Stanford Tuck later became godfather to Galland's son.

Bad blood still simmered, however, between adherents of Air Chief Marshal Hugh Dowding and former No. 11 Group commander Keith Park on one side, and Bader and former 12 Group commander, the late Air Vice Marshal (later Air Chief Marshal Sir) Trafford Leigh-Mallory on the other. In the battle, Leigh-Mallory's "Big Wing" strategy, depending on who tells the story, either failed to support Park's 11 Group or was not supported by it. "We are going to break a few eggs," director Hamilton had promised, "by showing for the first time some of the smelly things that were going on down below, in the Air Ministry, while the battle was being fought in the air."

Park, in 1968 a city councilor in Auckland, New Zealand, had kept tabs on the production and disparaged it in the Kiwi press, especially when Rex Harrison, who had actually been one of his junior officers in 1940, withdrew from playing him. "There was a dirty little intrigue going on behind the scenes among Air Ministry staff and the group immediately to the rear of No. 11," Park told reporters. "As a result of this intrigue, just after the Battle of Britain was won, the Air Ministry sacked Dowding, and I was sent off to a training command."

Pilots had taken sides in 1940 and clung to them in 1968. To the consternation of Stanford Tuck, Lacey called Leigh-Mallory "a clot." Matters came to a head when Dowding himself—then 86, wheelchair-bound, nearly blind and still bitter—visited the *Battle of Britain* set. He was rolled in to view rushes of the scene where Olivier, playing him, tells a stuffy air minister that Britain's back

NO SFX REQUIRED

Left: Chief stunt pilot Wilson "Connie" Edwards stands in the cockpit of a Spitfire IX, his favorite of the many aircraft he flew during filming. Right: A wartime hangar at Duxford explodes for real in the movie—a scene the British no doubt came to regret.

is to the wall: "Our young men will have to shoot down their young men at the rate of four to one." When the lights came up, production paused while the famously stoic air chief marshal wept.

Dowding was seen to coach Trevor Howard, playing Park, and afterward wrote his former group leader, "I hope I can relieve you of any apprehensions as to the treatment you will receive at the hands of the film company." *Battle of Britain* doesn't try to resolve the Big Wing controversy, but simply gives Dowding what he did not get during the war: credit for victory. "If it hadn't been for him, old boy," Bader admitted to Shaw, "we might be digging salt out of a Silesian salt mine," and on second thought, "...I'd probably be dead, but your generation would."

That fact flew over the heads of audiences and reviewers. "The aerial scenes are allowed to run forever and repeat themselves shamelessly, until we're sure we saw that same Heinkel dive into the sea (sorry—the 'drink') three times already," opined film critic Roger Ebert, clearly no aviation buff. After all the expense—and going up against late-'60s antiwar sentiment and cynicism—*Battle of Britain* not only failed to turn a profit, but lost \$10 million globally.

Since then, however, video sales have more than made up the difference, and it remains a cult favorite. A long-running Hollywood rumor has it that 20th Century Fox has signed director Sir Ridley Scott, who describes the subject as a passion of his, for a new movie on the battle. As many of the original's warbirds are still flying, and so many more are being restored that there are more Spitfires and Hurricanes available now than in 1968, using real planes might be cheaper than CGI. And a whole new generation might hear those same Merlins roar again. ✚

Frequent contributor Don Hollway wrote about making *The Blue Max* in our July 2015 issue (see historynet.com/making-the-blue-max.htm). For further reading, he recommends: *Battle of Britain: The Making of a Film*, by Leonard Mosley, and *Battle of Britain: The Movie*, by Robert J. Rudhall.

ASKED FOR THE MORAL OF THE MOVIE STORY, DOUGLAS BADER SAID, "SURELY THE LESSON IS THAT ONE FORGIVES BUT ONE DOESN'T FORGET."



THUNDER IN THE CINEMA

HOLLYWOOD'S FICTIONAL U.S. AIR FORCE FILMS OFTEN DIVERGED FROM REALITY, BUT MOST ARE WORTH WATCHING IF ONLY FOR THE AERIAL SEQUENCES FEATURING RARE JET AIRCRAFT BY MARK CARLSON

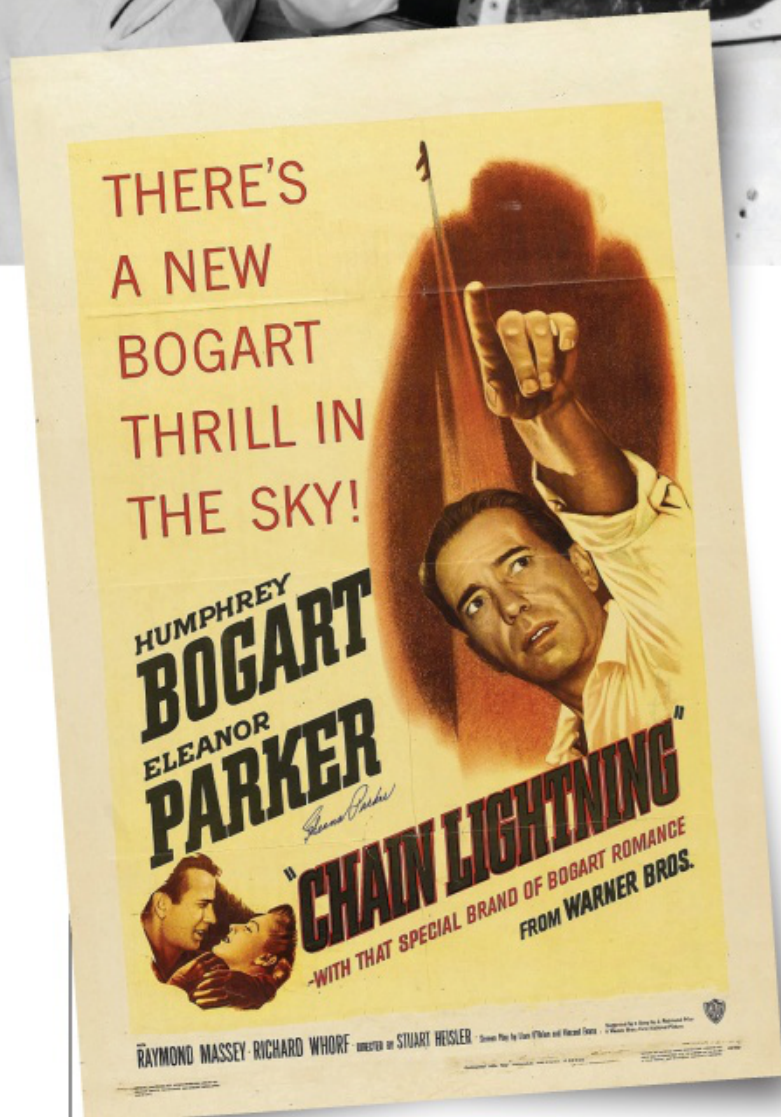


BACK-SEAT FLIER

Karl Malden's character (center) keeps a close eye on Efrem Zimbalist Jr., who plays his daughter's suitor in the U.S. Air Force-supported 1957 film *Bombers B-52*.

IDENTIFIED BOGEY

Humphrey Bogart (right) assesses the progress on the new Willis aircraft, in 1950's *Chain Lightning*.



IN THE MID- TO LATE 1940S THE DRONE AND ROAR OF AIRCRAFT PISTON ENGINES FADED AND WAS REPLACED BY THE HOWL AND SCREAM OF TURBOJETS. HOLLYWOOD, IN ITS NEVER-ENDING SEARCH FOR CUTTING-EDGE ENTERTAINMENT, SNATCHED AT THE NEW ERA IN AVIATION.

Needle-nosed jets with sweptback wings were an irresistible draw to those raised on space heroes like Flash Gordon and Buck Rogers. Some films that emerged from the postwar dream factories were slapdash affairs, while others were major efforts to depict a world hardly imagined by middle-class American audiences.

Howard Hughes' costly fiasco *Jet Pilot*, filmed in the late 1940s, became a laughingstock upon its release in 1957, when the aircraft it featured were hopelessly outdated. But the superb *Strategic Air Command* of 1955 was as fine a work of the filmmaker's art as has ever touched the silver screen. In this article we'll revisit a few old favorites, discover a couple of virtually forgotten films and explore others that deserve more appreciation than they received when they first appeared in theaters.

Chain Lightning, released by Warner Bros. in 1950, is the story of former B-17 pilot Matt Brennan (Humphrey Bogart) and hard-nosed millionaire aircraft designer Leland Willis (Raymond Massey) joining forces to test the new Willis JA-3 supersonic jet. Willis hopes to impress the Air Force with a nonstop flight from Nome, Alaska, to Washington, D.C., via the North Pole. Test pilot Carl Troxell (Richard Whorf) wants to design a safer escape pod-equipped version, the JA-4, but Brennan is unconvinced it will work. Brennan successfully flies the JA-3 from Nome to Washington, but learns that Troxell has been killed testing the JA-4. Despite his reservations about the escape system, Brennan takes up another JA-4 and purposely ejects from it during a demonstration flight in front of Air Force officials to prove the new jet is safe.

The starring aircraft is sleek with a needle nose, just as American audiences would expect at the time. It has no air intakes, but that detail seems to go unnoticed. Some footage was shot on location at southern California's Muroc Army Air Base, now Edwards Air Force Base.

Toward the Unknown is an almost-forgotten 1956 film starring William Holden as Major Lincoln Bond, a Korean War ace who had been captured by the North Koreans and, after more than a year of torture, forced to sign a confession. Bond goes to Edwards AFB seeking work as a test pilot, but Brig. Gen. Bill Banner (Lloyd Nolan) is not convinced he is trustworthy and blocks his appointment. Banner finally allows Bond to fly routine support and chase missions for other pilots. Bond soon pilots the new Gilbert XF-120 fighter, which the Air Force is considering accepting for production, and realizes it is structurally unsound. He tries to convince Banner that the jet is unsafe, but the general doesn't believe him.

After Bond saves Banner when his drogue chute deploys prematurely during a test flight, they learn to trust one another. Bond is given the coveted assignment to fly the new X-2 rocket plane, though Banner wants to fly it himself. Without orders,



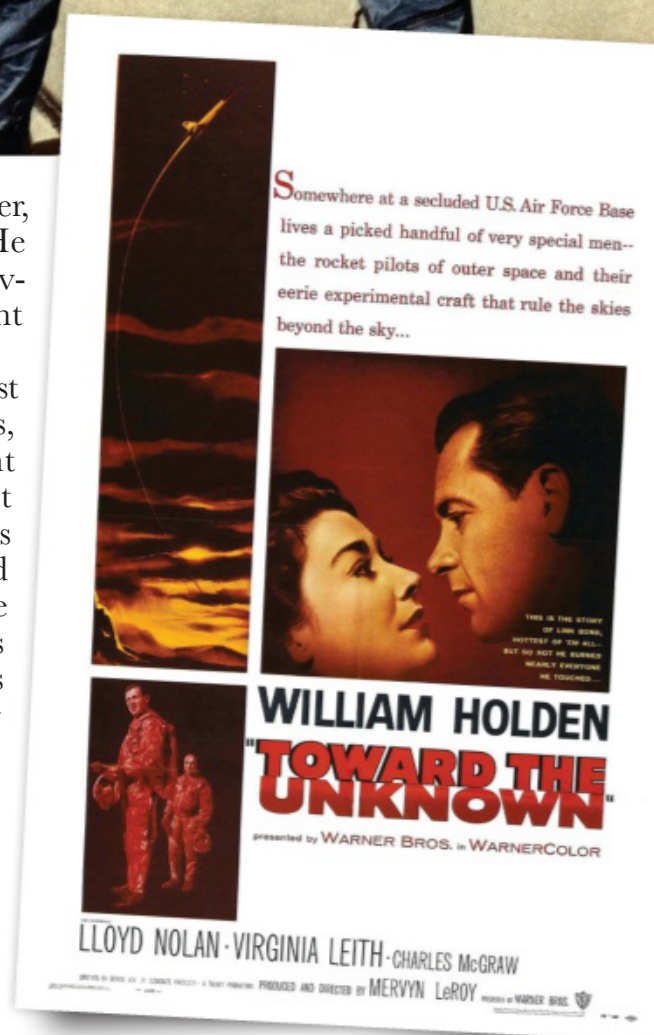
Bond takes the plane to full power, throwing it out of control. He barely survives the bailout, leaving Banner to realize that flight testing is for younger men.

Toward the Unknown was almost exclusively filmed at Edwards, home of the Air Force Flight Test Center. One of the best scenes used process mockups and miniatures to show Bond flying his Convair F-92 chase plane directly behind Banner's XF-120. When the XF-120's drogue chute deploys, making the aircraft virtually impossible to fly, Bond pushes the wingtip tank of his plane into the center of the chute, forcing it to collapse and enabling Banner to land safely.

The film features a virtual inventory of aircraft the USAF was testing and flying in 1956.

The Convair C-131 Samaritan and F-102 Delta Dagger, Douglas B-66 Destroyer, Lockheed F-94 Starfire and North American F-86 Sabre are seen in flight and on the ground. A rare Boeing YKB-29T, an experimental tanker version of the Superfortress, fuels the North American F-100 Super Sabre and McDonnell F-101 Voodoo. The Martin XB-51, which portrays the XF-120, was not accepted by the Air Force for production, so this film offers rare views of it in flight. The Bell X-2 rocket plane also appears, along with the rapier-like Douglas X-3 Stiletto and D-558-2 Skyrocket in which Scott Crossfield broke Mach 2 in 1953.

The Air Force was experimenting with "zero length takeoffs" using rocket sleds while *Unknown* was filming, and a Republic EF-84G Thunderjet is seen testing the system. A look at the background reveals a Boeing B-47 Stratojet, Beech C-45 Expeditor, Convair B-36 Peacemaker and North



BODY DOUBLES

Top: William Holden (right) and Lloyd Nolan play test pilots and a rare Martin XB-51 bomber plays the Gilbert XF-120 fighter in director Mervyn LeRoy's treasure trove of 1956 aircraft, *Toward the Unknown*.



DATED ENTRY

Top: Although Janet Leigh and John Wayne provided star power, *Jet Pilot's* aircraft were outdated by the time of the film's release.

into the motion picture business when the jet age began. The result, for what it's worth, was 1957's *Jet Pilot*. It was vintage Hughes, with an unbelievable plot, big budget overruns and spectacular aerial photography.

Colonel Jim Shannon (John Wayne) is ordered to play host to defecting Soviet pilot Lieutenant Anna Marladoyna, played by Janet Leigh three years before her shower scene in *Psycho*. Shannon

American B-45 Tornado. Audiences were further treated to an early demonstration by the Air Force Thunderbirds in their F-84F Thunderstreaks.

Noted Air Force historian Walter Boyne gives *Toward the Unknown* high marks. "This picture was made by the airplanes that appeared in it and is worth seeing just for the XB-51," he commented.

Howard Hughes, whose epic 1930 film *Hell's Angels* (story, P. 60) focused on World War I aviation, made a major leap

falls in love with Marladoyna and marries her in order to keep her from being deported. When his wife is accused of being a spy, Shannon sneaks her into a Lockheed T-33 Shooting Star and takes her to Siberia. After a long series of unbelievably casual interrogations, the Soviets convince Shannon to test their version of a "parasite" fighter. Anna helps her husband escape back to the States, bringing the story full circle.

Principal photography was completed in 1949, but the Red Scare and McCarthyism convinced RKO Pictures to keep *Jet Pilot* on the shelf for eight years. By the time audiences saw it in 1957, the aircraft were obsolete.

Jet Pilot was shot on location at George Air Force Base in Victorville, Calif., and Edwards. Eager to promote itself, the Air Force willingly offered assistance in base facilities, aircraft and personnel, including Major Chuck Yeager, who just a year earlier had exceeded Mach 1 in the Bell X-1. The naturally adventurous Yeager had initially been thrilled at the prospect of mixing it up with Hollywood stars but ended up being disappointed. He never saw Wayne or Leigh. He did all the dangerous flying in an F-86 and spent his time at 15,000 feet being filmed by Paul Mantz in a B-25 camera plane. Director Josef von Sternberg told Yeager they needed the kind of flying that only he could do. In one shot he dived into the overcast inverted at 12,000 feet with another pilot flying chase, then pulled out down on the deck. Then he

reached Mach .92 in a vertical dive, and when he pulled out the g-forces tore the elevator off the tail, along with about a third of the horizontal stabilizer. Yeager's wingman saw how low he was when the tail tore off and assumed he had crashed.

The X-1, with its wings and stabilizers painted white, served as the Soviet parasite fighter, dropped from a B-50 Superfortress. With Yeager at the controls, it was the last flight of the famed rocket plane. T-33s, painted to alter their silhouettes, stood in for Soviet Yak-12 fighters. To explain this, Shannon remarks, "It looks like a Soviet version of our T-33."

Jet Pilot is a drama, but it might be more aptly described as a fantasy or comedy. American audiences must have spent more time laughing than watching. Regarding the film in general, the Korean War F-86 ace Colonel Ralph Parr said, "It's a better movie for the planes than the story. It's just too ridiculous."

Screen legend Jimmy Stewart, who piloted B-24s during World War II, was back in the sky in ***Strategic Air Command*** (1955). The extravagant Technicolor production by director Anthony Mann and writer Beirne Lay Jr. (also a WWII combat veteran) exposed a world hardly imagined by Americans. Released in the first decade of the Cold War, *Command* centers on former B-29 pilot turned professional baseball player Robert "Dutch" Holland (Stewart), who is married to Sally, played by America's sweetheart June Allyson. Dutch is ordered to go on active duty in the new Strategic Air Command for 21 months. At first he is resentful but in time feels a sense of duty to the job, the

men and the planes.

Harry Morgan portrays a veteran sergeant who shows Dutch through the interior of a huge B-36 bomber. "What do you think of her, Colonel?" the flight engineer asks.

"She's a battleship!" Dutch replies. Dutch soon becomes so dedicated to SAC that he puts his work ahead of his family, and drives himself to near exhaustion to complete a full deployment of a B-47 wing to Japan.

Carswell Air Force Base in Texas, home of the 7th Bomb Wing, was the location for most of the ground and flying sequences. The B-36 Peacemaker is seen in several flights both real and in miniature. Director of photography William Daniels was responsible for the beautiful cinematography.

Real-life former B-36 copilot Major Walter Douglas was at Carswell AFB when the movie was being filmed. "I watched as Paul Mantz in his B-25 camera plane followed the B-36 into the air," Douglas recalled. "He had that plane right off the port wingtip and stayed with it all the way until

STARRED REVIEW

"It really made the B-36 [below] look good," said Major Walter Douglas—who had served as a copilot in *Peacemakers*—of the film *Strategic Air Command*.





THE ICEMAN COMETH

In *The Hunters*, very loosely based on James Salter's Korean War novel, Robert Mitchum's North American F-86F (top) battles MiG-15s, portrayed by Republic F-84F Thunderstreaks.

they had the footage they needed." Douglas was impressed by the final film. "It really made the B-36 look good," he said. "That was a lot of airplane, and the movie did a good job of it."

For the B-47 Stratojet sequences, Paramount made good use of Air Force aerial refueling footage. When Dutch is trying to land in bad weather at Kadena AFB on Okinawa, the camera shoots from over his shoulder to peer through a windscreen being swept by a single wiper. The cockpit mockup is now on display at the March Field Air Museum in Riverside, Calif. The aircraft exterior and interior scenes are so

technically detailed that it wouldn't be surprising if the film was studied by Soviet intelligence.

On the tails of *Command* came another bomber epic, *Bombers B-52* (1957), which used SAC's massive Boeing B-52 Stratofortress as a backdrop for a battle of wits between a playboy pilot and a career sergeant. Karl Malden plays Master Sgt. Chuck Brennan, whose daughter Lois (Natalie Wood) is being romantically pursued by Colonel Jim Herlihy (Efrem Zimbalist Jr.). The Air Force is Brennan's career and life, but he is also a devoted husband and father. Herlihy tries to appease Brennan but is unable to convince the sergeant that his intentions are honorable. While this is going on, the new B-52 is coming into service and the Air Force needs Brennan's expertise.

A fire aboard a new B-52 over a remote area forces the crew to bail out. Brennan remains on

board to try to save the ship but finally jumps, landing far from rescue. Herlihy finds him, and Brennan no longer protests the budding romance.

Directed by Gordon Douglas, *Bombers B-52* was shot on location at March AFB and Castle AFB outside Merced, Calif. The Stratofortress was brand-new at the time, and the USAF was happy to display its newest hardware. Because the main character was a dedicated career sergeant, *Time* magazine called the movie a "\$1.4 million want ad for Air Force technicians."

Zimbalist remembered that he was awed by the huge bombers and the men who flew them. "A pilot took me up on a flight and I was just amazed at the complexity," he said. "When we were on the runway he told me I could steer it over to the parking area. I said, 'I can't do that!' But the pilot said, 'Relax, just steer it like a car. There's the wheel, and there's the brake.' So I did. The smoothness was amazing. That enormous machine handled like a bicycle." Zimbalist did not receive much instruction about how to appear experienced at the controls. "I just sat there and did what they told me."

The skies over Korea are the setting for *The Hunters* (1958), a raw account of life and death in the air based on James Salter's autobiographical novel. Robert Mitchum is Major "Iceman" Saville, a confident former WWII fighter ace. Saville is second-in-command of an F-86 Sabre squadron in Korea under Colonel "Dutch" Imil, played by Richard Egan. In a complex plot involving extramarital affairs and overenthusiastic fighter pilots, *The Hunters* unfortunately deviates from Salter's classic work. But there are some compelling aerial combat sequences between the American F-86s and a top North Korean ace dubbed "Casey Jones" in a MiG-15. The F-86s were part of an operational squadron, and most of the aerial sequences were shot over Arizona, Nevada and California. The MiG-15s were played by F-84F Thunderstreaks painted in Communist markings.

In 1983 Philip Kaufman directed *The Right Stuff*, based on Tom Wolfe's bestselling account of the early days of flight test and the Mercury Program. While technically superb, *The Right Stuff* is about as historically accurate as an Abbott & Costello comedy.

Chuck Yeager (Sam Shepard) is first seen in Pancho Barnes' Happy Bottom Riding Club on the outskirts of Muroc Army Air Base in the Mojave Desert. When the current X-1 test pilot, Chalmers "Slick" Goodlin, demands an exorbitant fee for breaking the sound barrier, the Army finds itself in need of a pilot. One officer points across the room: "That guy over there, Yeager. Some kind of war hero. Shot down five Germans in one day."

In reality Yeager was at the time doing advanced flight-testing for the Army Air Forces at Wright Field in Ohio, under the aegis of Colonel Albert



Boyd. Boyd chose Yeager and Bob Hoover as pilots, Captain Jack Ridley as flight engineer and Major Bob Cardenas as the B-29 mother ship pilot and project manager (see “Dropping the Orange Beast,” May 2019 issue). Cardenas, a highly skilled engineer, former B-24 combat pilot and head of the Bomber Test section at Wright, doesn’t appear in the film. Ridley was one of the most brilliant engineers in the Air Force, but his film character is just a recurring sidekick to Yeager, doing little more than dispensing Beeman’s gum.

Edwards Air Force Base was the setting for most of the X-1 and later flight sequences. The X-1 aerial shots were filmed using models, as the FAA refused to allow the Ladd Company to drop the full-scale mockup from *Fifi*, the Confederate (today Commemorative) Air Force’s B-29. Yeager’s final appearance in the film involves a 1962 record-setting flight while he was commandant at the USAF Aerospace Research Pilot School at Edwards. In a modified Lockheed NF-104 Starfighter, he attempted to break the 114,000-foot altitude record set by a Soviet pilot. Contrary to the film’s portrayal, Yeager did not “steal” the plane. Jack Ridley is there to dispense more Beeman’s gum but had actually been dead since 1957. The Starfighter is a rare aircraft in film and very worth seeing in flight. The

THE RIGHT STUFF

How the future began.



STUFF OF DREAMS

The “right stuff” in Philip Kaufman’s 1983 film was mainly confined to aircraft such as the Bell X-1 (top) and the dramatic flying sequences.

movie aircraft was an F-104G that lacked the external rocket booster on Yeager’s NF-104.

The ejection sequence is accurately portrayed, if a bit confusing. Yeager’s seat rig had an explosive charge to blast it out of the plane. While he was falling alongside the seat, its still-glowing end struck him and broke open his helmet, severely burning his face and hands.

All in all, only *The Right Stuff*’s aerial sequences have real value. If the movie is viewed as a fictional dramatization of historical events it holds up, but it should not be taken too seriously. The one thing it can be commended for was its effect on the American public. After the film’s October 1983 release, Yeager and the Mercury astronauts found themselves in the spotlight again. Suddenly astronauts most Americans had forgotten or ignored for nearly 20 years were again sought out for public appearances and autographs. I count myself among those who were profoundly affected by the story, and its effect has not faded to this day. ✈

Frequent contributor Mark Carlson is the author of Flying on Film: A Century of Aviation in the Movies 1912-2012, which is recommended for additional reading.



THE REAL THING

Stunt pilots Frank Clarke and Roy Wilson fly World War I-vintage Royal Aircraft Factory S.E.5a and Fokker D.VII (with camera) biplanes during filming of an aerial sequence in *Hell's Angels*.



HOWARD HUGHES' HELL'S ANGELS

THE MILLIONAIRE MOVIE
MOGUL OVERCAME
DAUNTING PRODUCTION
PROBLEMS TO SHOOT SOME
OF THE MOST MEMORABLE
AIR COMBAT SEQUENCES
EVER CAPTURED ON FILM

BY CHRISTOPHER WARNER



AERIAL MELEE

Shot over northern California, where cloudy weather provided needed perspective, the film's climactic dogfight scene used a cast of authentic warbirds.

THE MENACING SQUADRON OF FOKKER D.VIIS, LED BY LEGENDARY ACE MANFRED VON RICHTHOFEN, PROWLED IN TIGHT FORMATION AGAINST A TRANQUIL BACKDROP OF THICK, BILLOWY CLOUDS.

The wide-open canvas, however, soon became cluttered with the arrival of scores of British aircraft.

What followed was the most dizzying, fierce dogfight ever witnessed, featuring a steady exchange of blistering gunfire and acrobatic maneuvering—until the action was suddenly halted with a single command: “Cut!”

The hair-raising scene took place over the skies of northern California, not battle-torn Europe. And the order wasn't given by a high-ranking officer, but by 23-year-old novice director and aviation enthusiast Howard Hughes Jr., shooting his epic World War I movie, *Hell's Angels*. Ultimately, most of the film's drama would play out off-screen, including transitioning from silent film to sound, recasting lead actors, the death of four airmen and a scandalous performance by an unknown teenage actress, Jean Harlow. But then and now, the movie is best remembered

for the stunning aerial sequences that signaled the arrival of Hughes on the world stage.

Hughes' interest in flight developed at an early age. His father, a Houston businessman who made a fortune developing oil-drilling equipment, treated his son to a short ride aboard a Curtiss flying boat. Senior got sick, but junior was thrilled, sparking a lifelong love of flying—especially seaplanes. His dream of becoming an aviator was soon realized when his father died in 1924, making Howard a millionaire at the tender age of 19.

After taking the helm of the Hughes Tool Company and an arranged marriage to Ella Rice, a wealthy socialite and grandniece of the founder of Rice University (where Hughes dropped out after his freshman year), the ambitious young man headed west to make a name for himself in the burgeoning movie industry—the first of many obsessions that defined his remarkable

and often turbulent life. Hughes wasted little time, producing some low-budget films and getting a taste of the decadent Roaring Twenties lifestyle. He bought a 30-room hacienda-style mansion in the tony Hancock Park neighborhood situated next to L.A.'s Wilshire Country Club. The location allowed him to hobnob with the Hollywood elite while indulging in another passion: golf. Additionally, Hughes began learning to fly at Clover Field in Santa Monica and purchased a Waco 10 with a 220-hp Wright J-5 engine, a plane he had completely rebuilt and customized with leather and rubber padding in the cockpit.

The success of Paramount's 1927 war drama *Wings*, which would win the first Academy Award for Best Picture, motivated Hughes to make his own flying film—only bigger and better. Moreover, he was determined to make the movie on his own terms without any meddling from the all-powerful studio system. It also required the shy, lanky Texan to put up his own money for a budget that would continue to escalate throughout the production.

Hughes purchased a short story from his friend Marshall Neilan, and hired him to direct. Neilan would be the first of three directors to run afoul of the temperamental Hughes, who at times took the reins himself. The film's simple plot revolved around two disparate brothers, Monte and Roy (played by Ben Lyon and James Hall), schoolboys at Oxford until WWI breaks out. Succumbing to a lukewarm call of duty, they join the Royal Flying Corps while getting tangled up in a love triangle with Helen, a less-than-virtuous local gal (Greta Nissen), who along with Monte's yellow streak jeopardizes a daring bombing mission against the Germans. Got it? Doesn't matter. The star of the show would be the death-defying action when filming began in the fall of 1927.

Eager to prove himself to the stable of ace pilots he would soon employ, Hughes accumulated the requisite number of flying hours and received his pilot's license. He then hired top stunt pilot Frank Tomick, who later recalled his first meeting with the future mogul: "He told me he needed a bunch of planes. Camels, S.E.5s, D.VII Fokkers. 'Get all you can.' So we went out all over the country, wired and found out where they kept some planes."

Hughes spared no expense rounding up as many vintage WWI aircraft as possible, determined to make *Hell's Angels* look genuine and realistic. He acquired five D.VIIs, two Royal Aircraft Factory S.E.5as and two Sopwith Snipes, but eventually disguised several American-made biplanes to resemble actual warbirds. Thomas-Morse S-4C Scouts doubled as Sopwith Camels; Curtiss JN-4 "Jennys" became Avro 504Ks; Travel Air 2000s ("Wichita Fokkers") helped complete an enemy squadron; and a massive, twin-engine Sikorsky S-29A received a heavy makeover for its transformation into a German Gotha bomber. In all,



Hughes bought or leased more than 40 planes (although he often exaggerated the number to nearly 100), and now shifted his focus to find the very best pilots to fly them.

Tomick helped recruit an elite corps of leading stunt pilots, barnstormers and WWI aces. The impressive lineup included Roscoe Turner, Frank Clarke, Al Wilson, Roy Wilson, Leo Nomis, Ira Reed, Ross Cooke and Maurice "Loop Loop" Murphy (world-record holder for 120 consecutive loops). Several airfields were used throughout the area, but to ensure secrecy, the notoriously paranoid Hughes converted a cow pasture in Van Nuys into a private airstrip and named it Caddo Field. Something he couldn't buy were clouds, a necessary point of reference to contrast the speed, depth and direction of the planes. The unfavorable conditions led to long, costly delays and snarky production signs declaring "War Postponed—No Clouds Today!"

While sequestered for lengthy periods in the hot sun, the restless daredevils enjoyed playing practical jokes on their eccentric, hotheaded boss. One such prank involved waiting for Hughes to enter the sole outhouse located on the rural grounds. Tomick then jumped into a nearby parked Airco DH-4 camera plane with its tail pointing directly at the primitive comfort station. A few other airmen helped crank the propeller as Tomick throttled the engine, causing the outhouse to topple over in a cloud of dust. Hughes was furious, and after crawling out of the makeshift men's room, fired the entire crew. But replacing hotshot pilots—a rare commodity—was difficult, and the merry pranksters were all rehired within an hour.



BEHIND THE SCENES

Top: The stunt flying and ground combat had to be carefully choreographed in advance. Above: With the advent of "talkies," Howard Hughes was obliged to replace his Norwegian-accented leading lady with Jean Harlow, who ended up getting top billing.



FALLEN ENEMIES

Top: Hughes' pilots pose with the Sikorsky S-29 that was modified to resemble a German Gotha bomber. Above right: A D.VII plunges to its doom. Above: Despite the sacrifice of several crewmen, the ghostly Zeppelin met a fiery fate.

In addition to lighthearted hijinks, the tight-knit group of aviators would experience several tragedies on set. Al Johnson ran into tension wires while delivering parts from Glendale and suffered horrific burns. He died the next day. Later, C.K. Phillips was killed after crashing an S.E.5a, and Rupert Syme Macalister, an Australian pilot, died in an accident that was never fully explained. Hughes nearly added to the list of fatalities when he attempted a risky stunt in one of the Thomas Morse Scouts. The "Tommy Scout" featured a rotary engine and could be tricky to handle. In his book *Howard Hughes: Aviator*, ex-fighter and -test pilot George J. Marrett described it this way: "On takeoff the plane developed a strong gyroscopic effect when the tail was lifted because of the rotation

of the huge mass of the engine metal. This reaction caused the aircraft to veer off course, so its pilot would need to apply a large amount of rudder."

Hughes, not accustomed to being told "no" and determined to show the flying experts he wasn't a greenhorn, climbed into the Tommy Scout's cockpit at Mines Field (now LAX airport). Shortly after takeoff, he lost control and crashed hard, breaking bones in his face that required surgery and caused further delays. Production eventually resumed, but the skies above L.A. remained cloudless. Hughes then turned his attention to an elaborate setup, featuring miniature Zeppelins and life-size stuntmen. Shot inside a government dirigible hangar in Arcadia, the scene called for a bombing raid over London's Trafalgar Square followed by a ridiculous subplot involving a German-born Oxford classmate of Roy and Monte's, and several Kaiser-loving soldiers dutifully jumping to their deaths. Despite the corny melodrama, the appearance of the ghost-like airship would leave a haunting impression on audiences, and later prominently featured in Martin Scorsese's biopic *The Aviator*.

In late October 1928, Hughes finally got his white, fluffy clouds to begin shooting the climactic dogfight scene. There was just one problem:

GALA HOLLYWOOD PREMIERE

Hughes spared no expense for the grand opening of *Hell's Angels* at Grauman's Chinese Theatre on Hollywood Boulevard in May 1930.

The clouds were in Oakland. All cast, crew and equipment were hurriedly relocated to northern California, where Hughes meticulously staged his masterpiece. He worked closely with his chief aerial cinematographer, Harry Perry, to pioneer innovative techniques and intricate choreography. They placed multiple cameras inside several aircraft as well as remote-controlled outside mounts to capture the emotions of the pilots' faces while simultaneously recording the whirling intensity of an air battle. Hughes conducted most of the action aboard one of the camera ships, relentlessly demanding perfection and earning the nickname "Hundred Takes Hughes." His insistence on realism and not trick photography resulted in breathtaking sequences, and the only models used in the final dogfight were two 12-foot D.VIIIs that were shown colliding in midair and bursting into flames.

On March 22, 1929, tragedy struck once again when mechanic Phil Jones died in a designed crash of the Sikorsky. Al Wilson piloted the behemoth aircraft portraying the German bomber to an altitude of 7,500 feet before launching into an uncontrollable tailspin. Wilson managed to bail out, but Jones, who had been operating a smoke generator filled with lamp black, failed to get out in time and was killed on impact.

The advent of "talkies" created another unexpected setback that threatened to derail the production. Al Jolson's *The Jazz Singer* had recently ignited the box office, and the public demanded more. Facing ruin and having already spent \$2 million, Hughes decided to go all in and make *Hell's Angels* be heard—loudly. Fortunately, his coveted aerial footage could be salvaged by simply adding sound effects, but nearly all of the dialogue scenes required reshoots. Hughes would also need to quickly replace his Norwegian-accented leading lady. He then brought in director number four, James Whale, who later went on to direct Boris Karloff in *Frankenstein*, but now turned his attention to a "monster" of a different stripe.

Jean Harlow had only appeared in a handful of bit parts (including a few Laurel and Hardy comedies), but the 18-year-old platinum blonde knockout from Kansas City was about to become a household name and international sex symbol. The slight hiccup that she couldn't act didn't stop Hughes from casting her in the role of fun-loving Helen. After all, the camera loved her—and the combo of Harlow's risqué wardrobe and bawdy talk easily compensated for any lack of dramatic talent. Furthermore, the film set the tone for most of Hughes' future films, offering thin plots buoyed by plenty of action and sexual innuendo.



**HUGHES
CONDUCTED
MOST OF THE
ACTION ABOARD
ONE OF THE
CAMERA SHIPS,
RELENTLESSLY
DEMANDING
PERFECTION
AND EARNING
THE NICKNAME
"HUNDRED
TAKES HUGHES."**

Hughes' relationship with his wife became yet another casualty of the picture. Workaholic hours and a steady stream of dalliances doomed the marriage and sent Ella back to Houston for an uncontested divorce. The infamous "Black Friday" stock market crash in October 1929 didn't help matters either. But Hughes plowed forward nonetheless with dogged determination, sifting through more than 500 hours (2.5 million feet) of footage (he sold many of the unused scenes and outtakes to other studios for years afterward). The final cut featured a mashup of scenes with dialogue, silent sequences with titles, dubbed sound and even an eight-minute color scene—the only one in Harlow's career.

By the time of its release on May 27, 1930, *Hell's Angels* had cost \$2.8 million, becoming one of the most expensive movies made to date. Hughes inflated the production cost (and subsequent profits) for publicity purposes, but his splashy Hollywood premiere at Grauman's Chinese Theatre remains unsurpassed. Thousands of spectators lined Hollywood Boulevard as speeding aircraft flew overhead, producing red, white and blue trails; stuntmen parachuted into the crowd; massive floodlights lit up the night sky; and 600 policemen along with National Guard troops were called in to control the frenzied crowd, clamoring to glimpse the small army of movie stars on hand for the spectacular gala event.

In the end, however, Hughes' star shined brightest. The brash, tall playboy triumphantly used the platform for his movie to build a vast empire and emerge as a record-setting aviator. And nearly 90 years later, the air battles featured in *Hell's Angels* are widely regarded as some of the most memorable ever shot and a landmark achievement in cinematic history. ✚

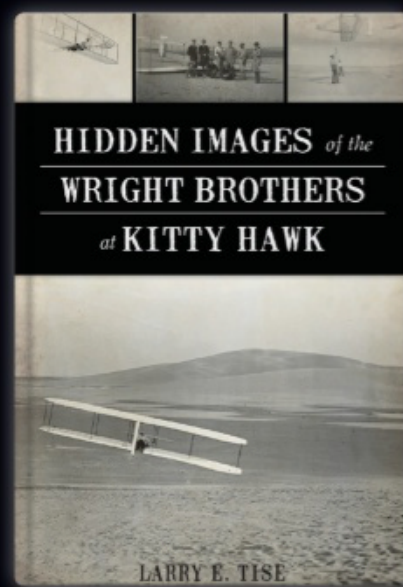
Christopher Warner is an actor and freelance writer who has written extensively about military history. Further reading: The Motion Picture Stunt Pilots and Hollywood's Classic Aviation Movies, by H. Hugh Wynne; and Seduction: Sex, Lies and Stardom in Howard Hughes's Hollywood, by Karina Longworth.



HIDDEN IMAGES OF THE WRIGHT BROTHERS AT KITTY HAWK

by Larry E. Tise, History Press, 2019, \$21.99.

Many people assume the only photographic record of the Wright brothers' most notable experiments with manned, controlled, powered flight is the iconic shot of Orville on takeoff, Wilbur trotting expectantly near a wingtip as though ready to grab something, anything, if the first flight went awry. In the words of this book, it is "perhaps the most famous and widely copied photograph in human history." >



THE WRIGHT STUFF

Orville (left) and Wilbur stand beside their Flyer.

nally made from those glass plates, they include fascinating marginal details never before published.

There are also numerous close-ups that give glimpses of everyday life—the Kitty Hawk postmaster's inquisitive dog; a label on a shipping crate; "shifty-eyed Samuel Payne," a lifesaver; Orville carefully chiseling a wing brace, his chest-brace hand drill to one side; Chase & Sanborn coffee cans in the Wrights' compulsively neat 1902 kitchen. This is a remarkable book filled not only with hidden images but hidden treasures.

Stephan Wilkinson

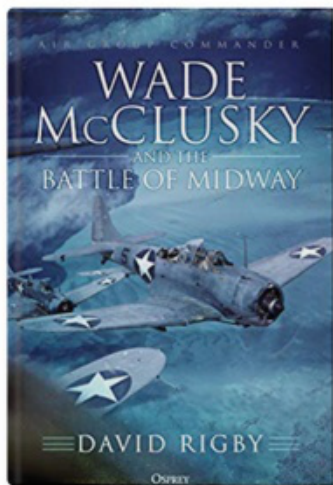
> Yet the Wrights were skilled and experienced photographers, again in author Larry Tise's opinion, "among the great amateur photographers of the early twentieth century." They had their own photo lab in Dayton and took with them to North Carolina's Outer Banks a

camera that recorded images on glass-plate negatives. (What a wry happenstance that "their" most iconic photo, of that first takeoff, was taken by John T. Daniels, a seaman from the Kill Devil Hills Life-Saving Station.) This slim but important softcover volume does much

to correct that misapprehension, with hundreds of long-lost photographs of the Wrights' work at Kitty Hawk between 1900 and 1911. Many of them are from restored and scanned negatives damaged by Dayton floodwaters in 1913, and unlike cropped prints origi-

WADE MCCLUSKY AND THE BATTLE OF MIDWAY

by David Rigby, Osprey Publishing, 2019, \$35.



Readers might rightly ask what more can possibly be written about the Battle of Midway that hasn't already been published. Military historian David Rigby answers the question with his new and important twofold study. On the one hand it is a long overdue biography of U.S. Navy pilot C. Wade McClusky, and on the other it's a retelling of the monumental Pacific air battle from the bird's-eye perspective of this pivotal yet often minimized participant.

Early in the book Rigby asserts that McClusky's counterintuitive decision to search for the Japanese fleet to the north of Midway rather than the south was key to winning the battle, something other histories have done. But then the author explains how McClusky came to make that critical decision, giving specifics about the air group commander's extensive naval flying background, ability to think through problems on the spur of the moment and cool-under-pressure personality. All of those factors led to his game-changing turn in the right direction on the morning of June 4, 1942.

The author passionately defends McClusky against detractors who have argued inaccurately that he lacked time in dive bombers, that he failed to grasp relevant tactics and that he "bungled" the attack against the Japanese carriers once finally sighted. Readers learn the intricate details surrounding this indispensable leader, and in the process gain a further understanding of the victory at Midway through an exhaustively researched history of the battle.

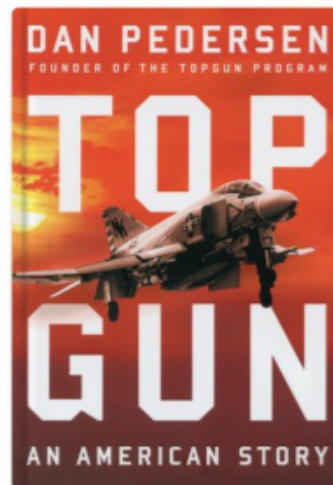
Quoting a blogger/historian, the author convincingly portrays McClusky as "exactly the right man being in exactly the right place at exactly the right time." His biography provides a fresh perspective on one of history's most famous battles.

Philip Handleman

TOPGUN

An American Story

by Dan Pedersen, Hachette Books, 2019, \$28.



Coinciding with the 50th anniversary of Topgun's founding, this book takes advantage of help from naval aviation history expert Barrett Tillman [author of "Topgun Turns 50," March 2019 issue]. It is definitely the work of retired U.S. Navy Captain Pedersen, however, and he can be proud of what he has written.

Pedersen devotes early chapters to his flight training and, after getting his wings, the free-for-all atmosphere off southern California, where eager young fighter pilots

would meet for impromptu dogfights, learning their trade in the uncontrolled atmosphere of "Fight's on! Check six!" He soon perceived a need for a dedicated advanced course in air combat maneuvering (ACM) during the midwar period of the Vietnam conflict, when the ratio of downed North Vietnamese MiGs to U.S. aircraft lost was very disappointing. Pedersen and his fellow F-4 Phantom and F-8 Crusader pilots came up with a plan for a course to address that deficiency. It wasn't easy, and initial classes at the Navy's Fighter Weapons School used borrowed facilities and flight lines from sympathetic tenant commands at Naval Air Station Miramar north of San Diego, colloquially known in the Pacific fleet as "Fightertown."

The crux of Pedersen's account is well worth reading. Of course, the iconic 1986 Tom Cruise movie helped publicize what the school eventually came to mean, if in typically overstated Hollywood style. The sequel is now scheduled to appear in 2020—albeit with the rumored plot already the subject of cynical criticism—and Topgun is now banished to NAS Fallon in the wilds of western Nevada.

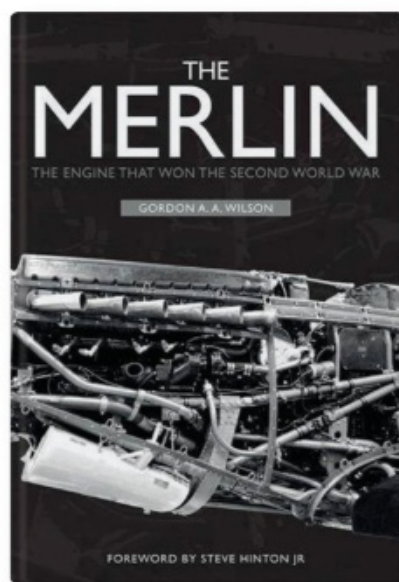
Even so, this very personal, highly readable account describes how one man's desire to provide advanced training to naval airmen became a fortunate reality 50 years ago.

Peter Mersky

THE MERLIN The Engine That Won the Second World War

by Gordon A.A. Wilson, Amberley Publishing, 2018, \$31.95.

Of the many books on this legendary engine, few have gone into such depths or detail. Author Gordon Wilson relates the fateful meeting of Henry Royce, a self-taught engineer of humble origin (orphaned at nine), and Charles Stewart Rolls, son of Lord Llangattock, and shows that Rolls was not just a wealthy dilettante but in fact held an engineering degree from Cambridge University. The partnership



led to the successful Eagle engine of World War I. By end of the war, Rolls-Royce had produced 60 percent of

all British aero engines.

The book covers Rolls-Royce racing engines in the interwar years, including the 36-liter, 2,530-hp Schneider Trophy-winning "R" that set a world air speed record of 407 mph. Shortly before his death from overwork, Royce ordered the design of a V12 engine "larger than [the 22-liter] Kestrel, smaller than the R." Royce had originally intended the resulting Merlin to be inverted (as was, for example, the German Daimler-Benz DB 601), to give the pilot a better sightline, but airframe manufacturers vetoed the idea.

Racing pilot Steve Hinton's

foreword describes how the original 900-hp Merlin, developing more than 2,500 hp by 1945, was boosted to over 3,400 hp to push his highly modified P-51 *Voodoo* to 531 mph, the fastest for a piston-powered aircraft. Wilson exhaustively lists every model of the 168,040 Merlins built, and the aircraft they powered—especially the Spitfire and Hurricane that saved Britain from invasion, and the P-51D Mustang, without which America's daylight bombing campaign would have failed—making a strong case that the book's subtitle is no hyperbole.

Nicholas O'Dell

AIR OFFICER COMMANDING

Hugh Dowding, Architect of the Battle of Britain

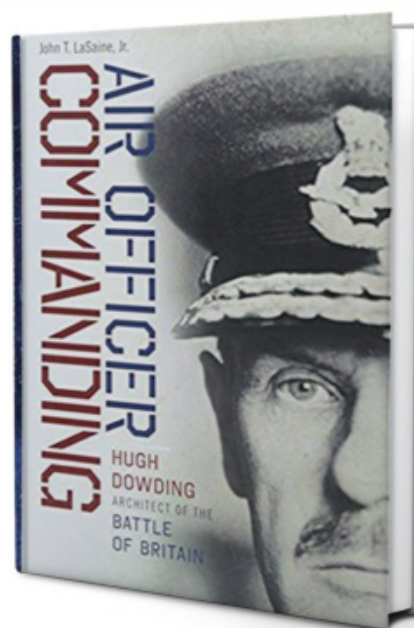
by John T. LaSaine Jr., ForeEdge, 2018, \$29.95.

Although a great deal has been written about Air Chief Marshal Hugh Dowding, so much of it has been based upon the personal recollections of individuals who were prejudiced for or against him that a new reevaluation is welcome. There is no question that Dowding was, and remains, a controversial figure in the history of World War II. As chief of Royal Air Force Fighter Command, Dowding has been credited with saving Britain. Yet only a few weeks after the battle was declared over, on November 24, 1940, he was summarily relieved of his command.

As John LaSaine's new

book shows, Dowding had a lot more to do with winning the Battle of Britain than the part he played during the summer of 1940. Before the war Dowding led efforts to modernize the RAF's equipment and tactics, including the development of such new aircraft as the Hawker Hurricane and Supermarine Spitfire, and the introduction of radar-directed fighter interception.

On the other hand, Dowding did not play politics well, either within the RAF or with the British government. For example, he defied the government and Winston Churchill by refusing to send the



latest Spitfires to France, insisting upon reserving them for home defense. History has since proven that decision correct. With the fighters that had not been squandered in France, Dowding was able to defend the skies above the Dunkirk beachhead and,

subsequently, over Britain itself. Within the RAF Dowding opposed the use of the "Big Wing" strategy espoused by Air Vice-Marshal Trafford Leigh-Mallory during the Battle of Britain—sending fighters in strength to meet oncoming German formations. In spite of the fact that Dowding's more-conservative strategy won the air battle, however, the Big Wing proponents won the political battle and replaced him.

Air Officer Commanding is a compelling biography of one of the few air force officers who may truly be counted among history's great commanders. It will certainly be of interest to anyone fascinated by aviation history, military history or the history of WWII.

Robert Guttman

AIRWARE

AEROFLY FS 2

IPACS, \$59.99 for PC, \$35.99 Mac, \$6.99 iPhone & iPad, \$3.99 Android.

A competition always leaves entrants that place behind the top competitor. Consider two competition losers, the Northrop YF-17 Cobra and F-20 Tigershark, which took a back seat to the General Dynamics F-16 Fighting Falcon. These aircraft didn't win big government contracts but were still respectable.

So it is with *Aerofly FS 2* (aerofly.com), the sequel to *Aerofly FS 1*. I'd looked at *FS 2*'s predecessor before and thought it an admirable effort for a flight simulator built by a company that had previously focused on radio-control aircraft simulation, but it lacked many of the features established competition possessed and the airplanes felt bouncy, like radio-controlled models. *FS 2* shares some of the same weaknesses but also adds some strengths.



FS 2 is a civilian flight sim much like the classic *Microsoft Flight Simulator*. There's no combat component and the gameplay centers on flying around airports and terrain. I found the flying portion of the sim to be pleasant and the aircraft renditions attractive, although the flight model seemed rather forgiving.

FS 2's stable includes a nicely curated selection of 18 useful and memorable airplanes. There are starter planes in the Cessna 172 and the Aermacchi MB-339 jet trainer, classic prop war-

birds (Vought F4U Corsair, Lockheed P-38 Lightning), big passenger jets (Boeing 737 and 747, Airbus A320), two military jets (McDonnell Douglas F-15 Eagle, Boeing F/A-18 Hornet), a pair of gliders and a few other aerobatic and passenger planes. Numerous liveries add welcome color. Cockpits are nicely represented, and the A320's workspace is an interesting contrast to the 737-500's instrument panel.

Airports and cities modeled in *FS 2* look nice too, but these are confined to the western United States. San Francisco at dusk and Las Vegas at night are worthy fly-bys, but there's nothing to see in Chicago, Frankfurt, Tokyo or London. *FS 2*'s biggest draws are its smooth performance and graphics, both beneficiaries of its newer engine. Experienced sim fliers will unfortunately miss a multitude of other features offered by even the dated competitors, such as air-traffic control, ambient aircraft, more city and terrain modeling, superior weather

support and dozens of third-party add-ons and aircraft. *FS 2* also lacks *Flight Simulator*'s ability to practice adverse scenarios such as operations during equipment failure.

FS 2 is indeed like an upstart runner-up in a competition. It's clear why it wouldn't be a first choice for many gamers. Its intriguing strengths need more countermeasures to be competitive. These may be forthcoming since the developers claim more aircraft, locales and features are on the way.

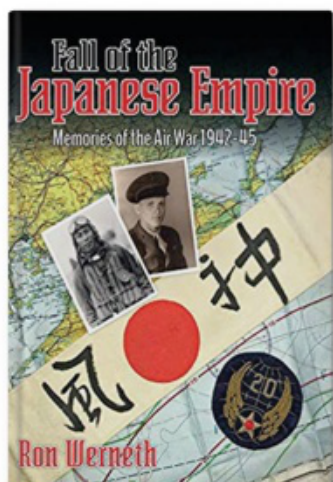
The bold may still want to consider *FS 2* for its virtual reality support. Fliers with a VR display will be treated to a different and immersive way to fly simulations. VR is also available for older simulations, but often only via add-on patches and is often less elegant than it is in products designed with VR in mind. I find current VR headsets expensive and clunky, though future versions of the technology should offer improved comfort and accessibility. Stay tuned.

Bernard Dy

FALL OF THE JAPANESE EMPIRE

Memories of the Air War 1942-45

by Ron Werneth, Elm Grove Publishing, 2018, \$59.99.



The history of World War II in the air has been given a welcome depth of human experience through the memoirs and recorded interviews of participating aviators from practically all combatant nations. Among the exceptions has been Japan, whose veterans generally keep their recollections to themselves or to survivors of their old units. Fortunately for posterity, Ron Werneth and the handful of dedicated colleagues who assisted him managed to break the ice with a great number of these former enemy airmen, preserving their perspectives on the Pacific and Asian air campaigns. These are combined with the biographies and experiences of their opposite numbers in *Fall of the Japanese Empire*, a follow-up to his earlier books, this time focus-

ing on the end of 1942 to 1945, when the Japanese were forced onto the defensive from the Solomons to the Home Islands.

Douglas Canning describes flying a Lockheed P-38G on the long mission to shoot down Admiral Isoroku Yamamoto on April 18, 1943, and Kenji Yanagiya recounts his ultimately vain effort to defend the admiral in a Mitsubishi A6M3 Zero. Grant C. Young recalls flying a TBM-1 Avenger to help sink the battleship *Yamato* on April 7, 1945, only to see his aircraft carrier, *Intrepid*, damaged by a kamikaze on April 16, while Morimasa Yunokawa expresses the frustration of witnessing the failure of the bomber-launched Yokosuka MXY-7 *Ohka* rocket kamikazes fielded by his air group. David R. Braden describes what it was like for a pilot barely into adulthood to assume responsibility for nine other young men inside a Boeing B-29, while Minoru Toyonaga recounts shooting down a B-29 in a twin-engine Nakajima J1N1-S *Gekko* night fighter. These are but a fraction of the fascinating insights contained in the author's text, complemented by a vast trove of photographs provided by the men he met. Anyone with an interest in the air war over the Pacific will find a lot of fresh material from a variety of viewpoints in *Fall of the Japanese Empire*.

Jon Guttman

A TALE OF TEN SPITFIRES

by Andrew Critchell, Pen and Sword Books Ltd., 2018, \$49.95.



Having frequently witnessed AR501, one of the last surviving Supermarine Spitfire Mark Vs, flying in aerial displays from the Shuttleworth Collection, Andrew Critchell wanted to learn more about that particular fighter's history. The most-produced version of the Spitfire, the Mk. V appeared in March 1941, at a time when Royal Air Force Fighter Command was transitioning from defensive operations over the United Kingdom to

offensive operations over the Continent.

The Spitfire V was developed to counter the new Messerschmitt Me-109F. In September 1941, however, the Spitfire V became, in turn, outclassed by the performance of another new German fighter, the Focke-Wulf Fw-190A. Although the improved Spitfire IX subsequently redressed the balance, it did not enter service until June 1942. How Spitfire V pilots coped with the supposedly superior performance of the Fw-190 over Western Europe during 1941-42 provides grist for this book.

Critchell expanded his research to include the nine aircraft that followed AR501 off the production line, regarding them as representative of the period and its particular tactical situation. He was interested to learn how their pilots dealt with what was considered a tactical disadvantage. His research provides some insight into fighter operations over Europe during the period after the Battle of Britain and before the U.S. Army Air Forces entered the air war. This book will also be of more than just British or American interest because many of those Spitfires turned out to have been flown by Czechoslovakian pilots serving with the RAF—starting with AR501 itself, which served with distinction in No. 310 Squadron, as shown on the cover illustration.

Robert Guttman

DORNIER DO 335 PFEIL/ARROW

by J. Richard Smith and Eddie J. Creek with Gerhard Roletschek, Crecy Press, 2017, \$79.95.



The Dornier Do-335 was one of the most technologically advanced and operationally formidable fighter aircraft developed in Germany during World War II. Frequently described as "brutal yet innovative," it was among the war's fastest and largest piston-engine fighters. Yet, when one examines the aircraft's specifications, its gross takeoff weight was about the same as that of another single-seat twin-engine fighter of the era, the Lockheed P-38 Lightning.

The P-38's length and wingspan varied from the Do-335's, but that stemmed from their different configurations. While the Lightning's two engines were mounted on either side of a central cockpit nacelle, the *Pfeil*'s were placed at each end of the fuselage, driving either a tractor or a pusher propeller.

The Do-335, like the P-38, was derived from a design initiated in 1937. However, while the U.S. Army Air Corps requested Lockheed to develop the P-38, Claude Dornier's design remained a private venture. Apparently, the Reich Air Ministry thought that Dornier should be a bomber-maker, not a fighter-maker. In consequence, development of the tandem-engine fighter project was delayed until it was too late.

To make matters worse, even when it later gave the green light to this formidable new fighter, the Air Ministry complicated its progress by demanding the simultaneous development of a variety of specialized subtypes intended for other roles. As a result, although the Do-335 first flew in October 1943, by war's end only 37 had been produced.

Exhaustively researched and liberally illustrated, this detailed but pricey volume provides the ultimate history of one of WWII's most remarkable fighters. It also represents yet another case of why the German aircraft industry ultimately failed.

Robert Guttman



MYSTERY SHIP

Can you identify this movie star airplane? See the answer below.

CAREER CHANGES

1. The Royal Aircraft Factory B.E.2c was conceived as a stable reconnaissance platform in 1912; in what other role did it excel in 1916?
A. Bomber
B. Anti-Zeppelin night fighter
C. Escort fighter
D. Torpedo plane
2. What long-range reconnaissance design evolved into a successful escort fighter by 1918?
A. Caudron R.11A3
B. Bristol F.2B Fighter
C. F.E.2d
D. Hannover CL.IIIa
3. What high-altitude interceptor design achieved success as a ground attacker and dive bomber?
A. Junkers Ju-88A
B. Ilyushin Il-2
C. Sukhoi Su-2
D. Petlyakov Pe-2
4. Which heavy fighter changed its role to high-speed reconnaissance and then night fighter?
A. de Havilland Mosquito
B. Dornier Do-17
C. Nakajima J1N1
D. Northrop P-61
5. Which interceptor achieved success as a fighter, bomber, recon plane and "Wild Weasel"?
A. Vought F-8 Crusader
B. McDonnell F-101 Voodoo
C. Republic F-105
D. McDonnell F-4 Phantom II

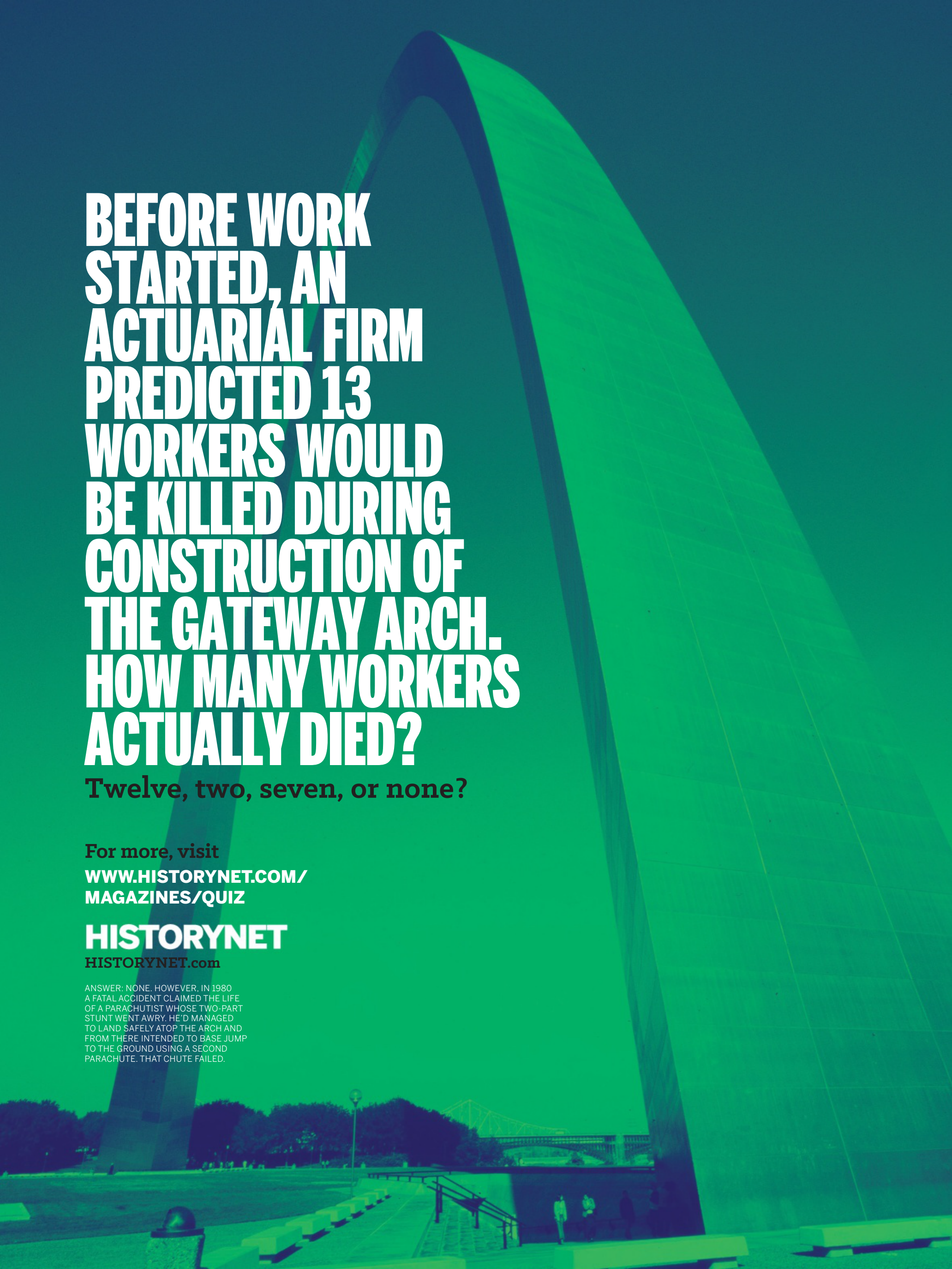
FLYING FILM STARS

Match the airplane to the movie in which it appeared.



- | | |
|-----------------------------------|--------------------------|
| A. Fairchild C-82 | 1. The Blue Max |
| B. Royal Aircraft Factory S.E.5a | 2. Tora! Tora! Tora! |
| C. Supermarine Spitfire | 3. The Dawn Patrol |
| D. Thomas-Morse MB-3 | 4. Dark Blue World |
| E. Grumman F6F Hellcat | 5. Red Tails |
| F. North American P-51D Mustang | 6. High Road to China |
| G. Thomas-Morse S-4C | 7. Flight of the Phoenix |
| H. North American T-6 | 8. Wings |
| I. de Havilland D.H.82 Tiger Moth | 9. Flying Leathernecks |
| J. Stampe SV-4 | 10. Hell's Angels |

ANSWERS: MYSTERY SHIP: Capelis XC-12. Learn more about it at HistoryNet.com/aviation-history
FLYING FILM STARS: A.7, B.10, C.4, D.8, E.9, F.5, G.3, H.2, I.1, J.6. CAREER CHANGES: 1.B, 2.A, 3.D, 4.C, 5.D.



BEFORE WORK STARTED, AN ACTUARIAL FIRM PREDICTED 13 WORKERS WOULD BE KILLED DURING CONSTRUCTION OF THE GATEWAY ARCH. HOW MANY WORKERS ACTUALLY DIED?

Twelve, two, seven, or none?

For more, visit

[WWW.HISTORYNET.COM/
MAGAZINES/QUIZ](http://WWW.HISTORYNET.COM/MAGAZINES/QUIZ)

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ANSWER: NONE. HOWEVER, IN 1980
A FATAL ACCIDENT CLAIMED THE LIFE
OF A PARACHUTIST WHOSE TWO-PART
STUNT WENT AWRY. HE'D MANAGED
TO LAND SAFELY ATOP THE ARCH AND
FROM THERE INTENDED TO BASE JUMP
TO THE GROUND USING A SECOND
PARACHUTE. THAT CHUTE FAILED.

NIGHT FIGHTER'S DEADLY TALLY

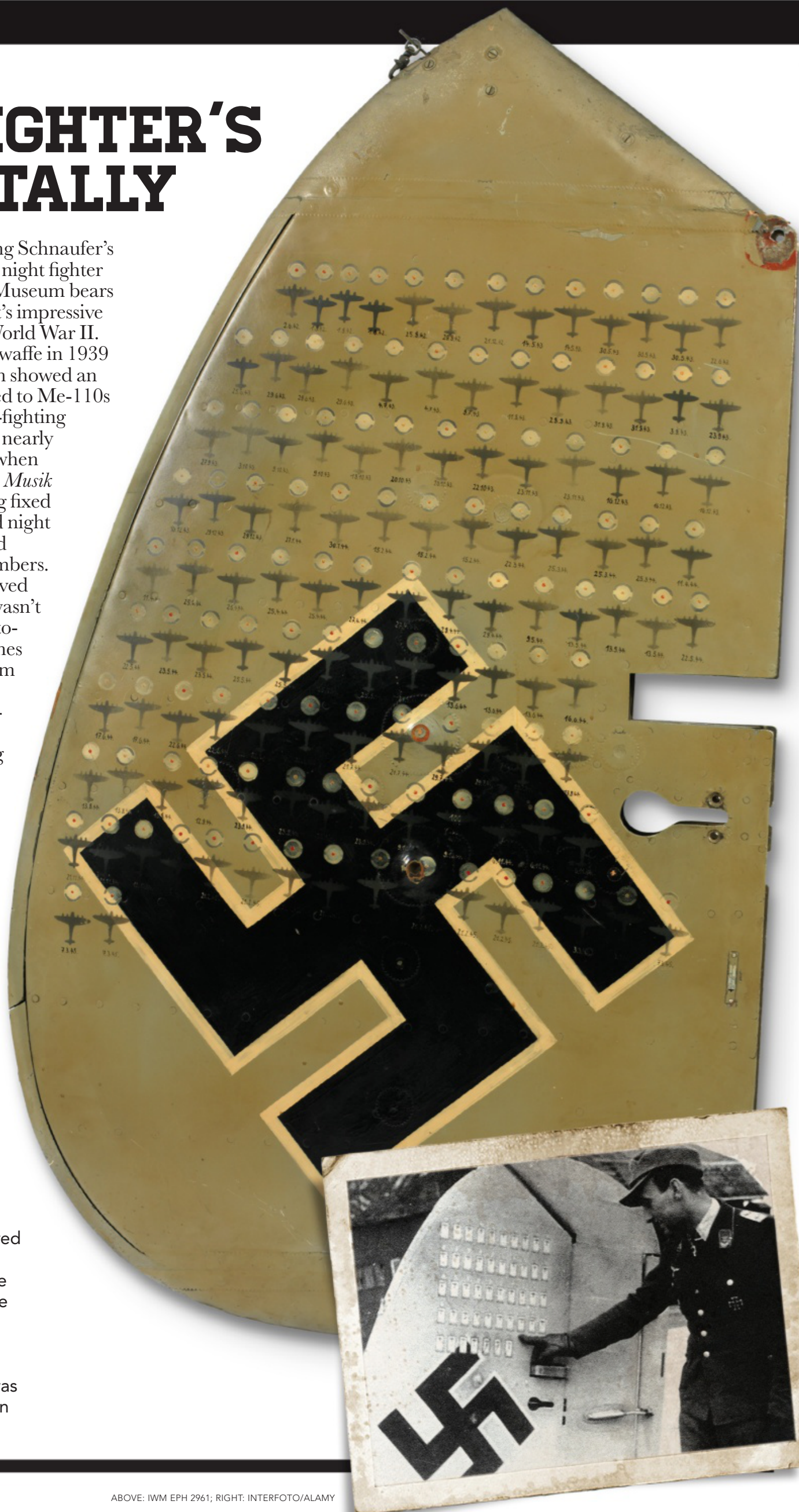
A rudder from Heinz Wolfgang Schnaufer's Messerschmitt Me-110G-4 night fighter in London's Imperial War Museum bears witness to the German pilot's impressive record of 121 victories during World War II.

Schnaufer enlisted in the Luftwaffe in 1939 as an eager 17-year-old and soon showed an aptitude for night flying. Assigned to Me-110s in the *Nachtjagdgeschwader* (night-fighting wings), he had already recorded nearly two dozen kills by August 1943 when the Germans introduced *Schräge Musik* (slanted music), an upward-firing fixed 20mm twin cannon that allowed night fighters to sneak underneath and destroy unsuspecting British bombers. Ironically, while the weapon proved extremely effective, Schnaufer wasn't a fan of it at first, after hearing stories of attacking German airplanes being struck by falling debris from British bombers.

Nonetheless, Schnaufer's winning streak continued, and he became history's highest-scoring night fighter ace. His greatest success came on February 21, 1945, when he shot down nine RAF bombers within 24 hours.

FORTY-SEVEN AND COUNTING

Heinz Wolfgang Schnaufer (right) shows off the 47 victories he scored in his Me-110 as of February 15, 1944. For his prowess fighting the British, Germany awarded him the Knight's Cross of the Iron Cross with Oak Leaves, Swords and, on October 16, 1944, Diamonds. Schnaufer survived the war but was killed in an automobile accident in France in July 1950.



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